SCHNITZER STEEL INDUSTRIES, INC.
3200 NW Yeon Avenue PO Box 10047 Portland, Oregon 97296-0047
Phone (503) 224-9900 FAX (503) 323-2804

VIA U.S. MAIL

January 15, 2009

1198010003/MADISON
HARTFORD/CHEMETCO, ESTATE OF
SF/Tech

Erin J. Rednour, Remedial Project Manager
Illinois Environmental Protection Agency
Bureau of Land
Division of Remediation Management
Mailcode 24
Post Office Box 19276
Springfield, Illinois 62794-9276

Re: Supplemental Response to Section 104(e) Request for Information Concerning the Chemetco Site in Hartford, Illinois

Dear Ms. Rednour:

This letter and its attachments supplement the May 27, 2008 response of Schnitzer Steel Products Company ("Schnitzer") to the Illinois Environmental Protection Agency's February 22, 2008 Section 104(e) request for information addressed to Schnitzer concerning the Chemetco Site in Hartford, Illinois. Specifically, the documents enclosed herein supplement Schnitzer's response to the following:

- Question 14, which concerns Schnitzer's receipt and response to a formal Information Request from U.S. EPA relating to the Gould Superfund Site in Portland, Oregon. See the attached at bates nos. Schn – 00487-00521; and
- Question 13, which requests copies of Material Safety Data Sheets ("MSDS") for any materials which may have been disposed of or shipped to or stored at the Chemetco Site. See the attached at bates nos. Schn – 00522-00616.

If you have any questions, please let me know. Thank you for your attention to this matter.

Sincerely,

Jim Jakubiak
Environmental Administrator
Schnitzer Steel Industries, Inc.

Enclosures

SCHNITZER INVESTMENT CORP

3200 N.W. Yeon Ave. P.O. Box 10047 Portland, Oregon 97210 Phone 503/224-9900 Telex/W.U. 36-0144 FAX 503/323-2760

March 21, 1988

Mr. David Tretta (HW.113)
U.S. Environmental Protection Agency
Superfund Branch
1200 Sixth Avenue
Seattle, Washington 98101

Dear Mr. Tretta:

NL/GOULD PRP REQUEST DATED 2/18/88

We received the subject request from your office on February 23, 1988, and have reviewed our files to provide as thorough a response as possible at this time. It is important to note, however, that prior to 1982 the entire property was leased by the Liquid Air Company who now operate on the southeastern half of the parcel. Much of the activity related to your request was and is under their direct control. Liquid Air has informed us that staff cannot supply a response to your request in the allotted time. As a consequence, we have developed the following information with what is currently available to us and plan to update the information when we receive Liquid Air's input. You may wish to contact them directly as well.

Responses provided herein are based on a review of our files on the property; a preacquisition audit conducted in September, 1986; and a recent site inspection by our technical consultant, Mr. Gaynor Dawson of ICF Technology Inc.

1) What are the generic names and chemical character of the hazardous substances, as defined under Section 101(14) of CERCLA, that you generate, store, treat, transport, dispose, or otherwise handle or have handled at the site? Briefly describe the activities and operations that were carried out by you or your company which involved these hazardous substances.

As noted in the preamble, the primary activity on the property in question has been the operation of the Liquid Air facility. That operation is directed to the production of acetylene and the distribution of hydrogen and fuel quality propane. While none of these substances are currently defined as hazardous under Section 101(14) of CERCLA, acetylene production by the carbide process does produce a calcium hydroxide slurry which may qualify as a corrosive hazardous waste (when the pH >12.5) under Section 3001 of RCRA. Prior to 1980, these wastes were placed in Doane Lake where they settled and were dredged for reuse. By 1982, the excess lime had been removed and the settling pond was backfilled with clean fill. The disposition of the reclaimed lime and the potential for some residues to remain on site is not known to Schnitzer Investment Corp., but we believe that some lime-based

materials were left on the soil surface over much of the site as indicated in Figure 1.

As a part of Liquid Air's operation, they have maintained a 1,500 gallon storage tank for acetone. The acetone is used as a carrier in the acetylene cylinders. To the best of our knowledge, this tank is still in use.

Storage tanks are also maintained as a part of the hydrogen and propane distribution activities to provide surge capacity. These products arrive at the plant via pipeline and are then redistributed.

Additional materials stored on site for use are liquid nitrogen for refrigeration, compressor oils for the hydrogen compressors, and <500 pounds of calcium chloride as a desiccant. None of these materials are designated hazardous under Section 101(14) of CERCLA.

2) If you do not believe hazardous substances were handled at the site, please briefly describe the activities and operations that were carried out by you or your company.

As noted under the first response, calcium hydroxide sludges have been disposed at the site and depending on their pH at the time of disposal, they may or may not have qualified as hazardous. In addition, nonhazardous fluff from the shredding of autos for metals recovery has been placed on the site. Based on our current understanding, the pile was placed on top of previously disposed hydroxide wastes from Liquid Air. The approximate location of the shredder fluff is indicated in Figure 1.

Approximately 4,500 cubic yards of fill dirt and demolition waste from the Portland area was brought in under a permit from the City of Portland (File No. CU2-82) to backfill the abandoned Liquid Air settling pond.

In summary, Schnitzer activity at the site has consisted of placement of clean fill in the abandoned settling pond and storage/disposal of nonhazardous solid waste residues from auto shredding. All other activities are related to operation of the Liquid Air Company plant as described under Item No. 1.

3) For each hazardous substance identified above, please describe how the substance was handled, when, and the total quantity in weight or volume (estimate if quantity not available).

We have no information concerning the volume of calcium hydroxide by-product produced and/or disposed by Liquid Air. Presumably, that information will be forthcoming in their response. As noted in Item No. 1, we believe the sludge was routed to the settling pond from which it was ultimately reclaimed for sale. We also believe that some solid materials were spread across the site as indicated in Figure 1.

Currently, liquid calcium hydroxide by-product is collected in a sump near the acetylene reaction chamber and pumped to steel holding tanks. The product lime is then removed for reuse.

By virtue of the tank size, acetone inventories never exceed 1,500 gallons.

4) Where was this material stored and where was it disposed of?

The disposal area and the location of the acetone tank are indicated in Figure 1. Storage of the liquid calcium hydroxide is accomplished in steel tanks marked on the figure.

5) What arrangements (if any) were made to transport the hazardous substances away from the site? Who was the transporter of the hazardous substances and what is his current/previous address?

The reclaimed calcium hydroxide was sold for reuse. We are not aware of who Liquid Air sold this material to historically, or where they subsequently used it. Currently, we believe the lime is removed from the storage tanks by Chem-Lime, Incorporated.

6) Provide all information you have regarding spills of hazardous substances on or around the site. This should include the generic name and chemical constituents of the material(s) spilled, the quantity of material spilled, cleanup measures taken, the cause for the spill, and any other related information.

No spills of hazardous substances have occurred in conjunction with our operations on the site. Four operations at the Liquid Air facilities have the capacity to spill as follows:

1) <u>Overflow from the Compressor Blowdown Tank</u>

Oily materials contained in blowdown from the No. 1 hydrogen compressor is routed to a compressor blowdown tank located behind the compressor room. If this tank were to overflow, the oil could spill onto the surrounding soils.

2) Overflow from the Waste Oil/Water Separator

Waste oil from the No. 2 hydrogen compressor is collected and transferred into an oil/water separator located behind the No. 2 hydrogen compressor room. Oily waste from this separator could overflow onto the ground in the immediate vicinity of the separator and flow into a catchment basin which ultimately discharges into a sump and then Doane Lake. Waste oil from other compressors is dumped into a second catchment basin and routed to the same sump.

3) Overflow from the Cooling Water Tower

Overflow from the cooling water tower could flow onto the ground and into the same catchment basin as oil from the compressors. The basin discharges to the sump and then Doane Lake. Cooling water contains two proprietary additives: 1) MXT-1, a microbiocide; and 2) POSCA-25W, a nitrate-molybdate sequestrant. We have no information on the chemical makeup of these two additives.

4) Overflow from the Liquid Calcium Hydroxide Tanks

The liquid calcium hydroxide (lime) waste product from acetylene production is currently collected in a sump outside the acetylene generator room after flowing from the reaction chamber. The lime is then pumped to steel tanks where it is held until removal for reuse by Chem-Lime, Incorporated. The liquid calcium hydroxide could overflow the tanks into the ground and into the wastewater sump which discharges to Doane Lake.

All inquiries related to the above should be directed to Liquid Air.

7) Describe all environmental investigations that have taken place on or around your property/facility. This includes investigations of the physical and chemical characteristics of soil, surface water, sediments, air, and groundwater. This also includes historical evaluations of potential/known contamination. Provide all relevant information including, but not limited to, study design, work plans, quality assurance procedures, sampling procedures, well logs, study results, and data analysis. Raw data need not be provided at this time; data summaries will suffice.

Two environmental investigations have been conducted on the

Schnitzer property. The first was a preacquisition audit conducted in September, 1986. No samples were taken during that effort. Activity consisted of a walkthrough and review of operations at Liquid Air. The bulk of our knowledge of Liquid Air's operations stem from this investigation.

The second investigation was the RI for the NL/Gould site. Permission was granted for Gould's contractor, Dames & Moore, to install two groundwater monitoring wells on the site (Figure 1). We have not received detailed results from subsequent analyses, but have been provided an isocontour plot indicating lead levels are <0.02 mg/l and sulfate levels are <50 mg/l.

8) Provide all information on all wells on site including the number, locations, associated well logs, date of installation, purpose of installation, and whether the well(s) are being used currently and for what purpose.

There are five known wells on the property as indicated in Figure 1. The two Gould monitoring wells were installed by Dames & Moore as a part of the NL/Gould RI. These continue to be used for monitoring purposes. Of the three remaining wells, two are abandoned and one is still in use as a source of water for the acetylene production cooling tower (Permit No. G6015). The water is not distributed for potable use. The location of the well currently in use is shown in Figure 1. We are not certain at this time as to the exact location of the two abandoned wells.

9) Provide information regarding all underground storage tanks (see definition above) at the properties owned or leased by you or your company. Specifically, provide a list describing the location, age, construction, contents, and leak detection system or other monitoring systems for each tank. Provide a map showing the location of each tank and associated pipelines. Indicate if there are any underground storage tanks no longer in use on the properties.

To our knowledge, there is a single underground storage tank on the property, the 1,500 gallon acetone storage tank marked on Figure 1. This tank is constructed of steel and is served by galvanized steel pipes. The tank was installed new approximately 20 years ago and is not known to have leaked. Leak detection consists of stock inventory maintenance and analysis for water in the product. We are unaware of any overflow protection of external or internal corrosion prevention measures. We are not aware of any repair work on this tank or its appurtenances.

The liquid calcium hydroxide tanks are above ground constructs.

We are not aware of their piping arrangements, however, so they may fail the 10% rule and be classified as underground tanks. To the best of our knowledge they were not so registered by Liquid Air and we assume they, therefore, are entirely above ground.

10) Provide copies of all insurance policies that may provide liability coverage for damages resulting from releases of hazardous substances and/or hazardous wastes. This includes policies that are in effect as well as those effective when hazardous substances were released in the past.

We are currently reviewing our insurance coverage and cannot, at this time, identify the extent to which it would address damages resulting from releases of hazardous substances and/or hazardous wastes.

11) For responses under Item 4, 6, 7, 8, and 9 above, please provide a map which indicates relevant locations and depths.

All relevant features are identified in Figure 1.

Very truly yours,

Linda M. Wakefield
Vice President

LMW/ba

cc: Gaynor Dawson
Richard Bach
[redacted]

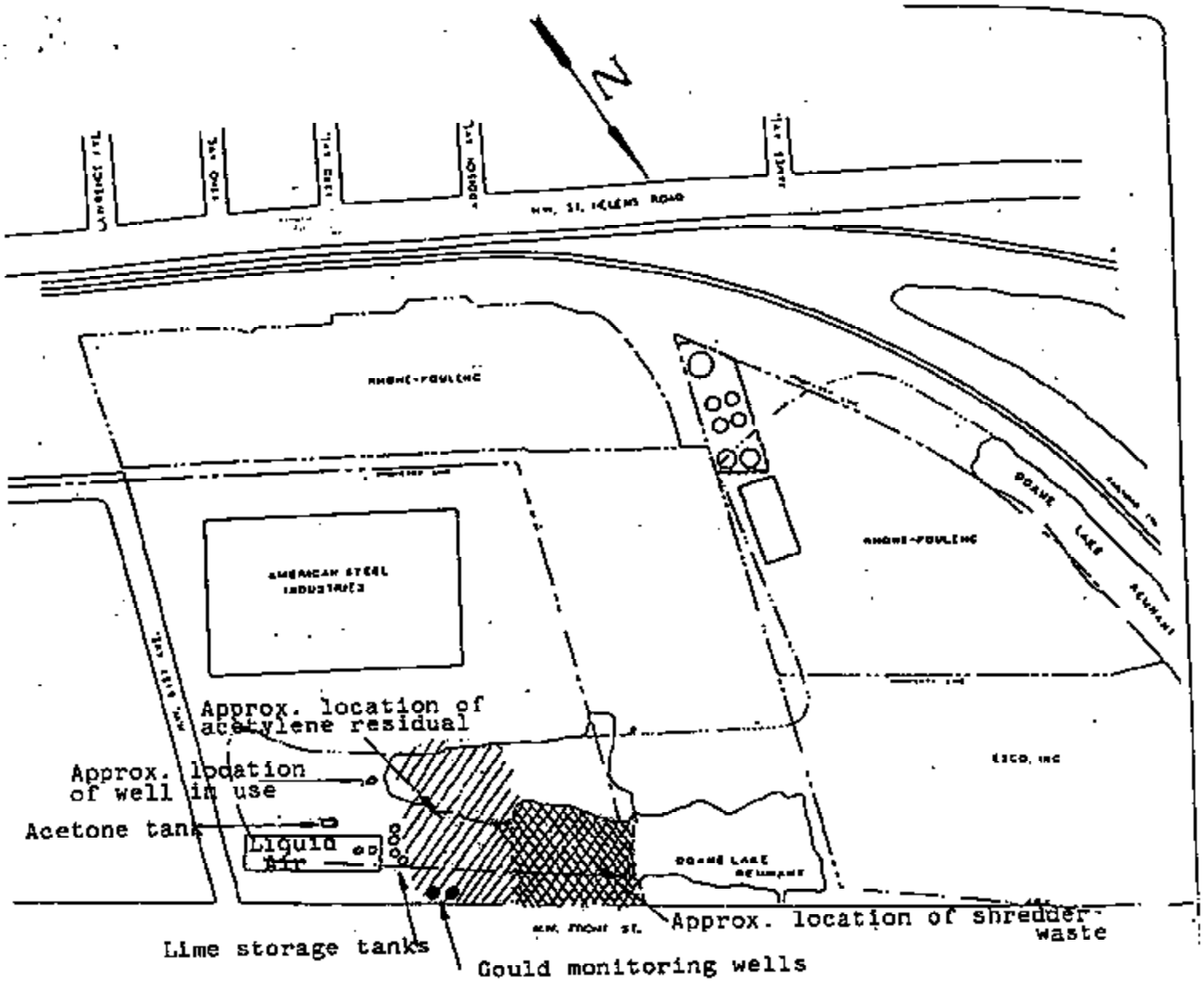

FIGURE 1. Relevant Features on the Schnitzer Property

SCHNITZER INVESTMENT CORP.

[illegible] P.O. Box 10367 Portland, Oregon 97210 Phone 503/224-9900 Telex/WU 36-0144 FAX 503-323-8702

April 28, 1988

Mr. David Tretta (HW.113)
U.S. Environmental Protection Agency
Superfund Branch
1200 Sixth Avenue
Seattle, Washington 98101

Re: NL/Gould PRP Request dated February 18, 1988

Dear Mr. Tretta:

Further to our response of March 21, 1988 to the referenced request, enclosed is a copy of the response we have received from Liquid Air Corporation.

Sincerely,

Linda M. Wakefield
Vice President

LMW:ws

Enclosure

cc: Gaynor Dawson
Mark Morford
Roger Nau

APR 29 1988

Superfund Branch

[redacted]

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LIQUID AIR CORPORATION
2121 N. California Blvd.
Walnut Creek, CA 94596
Telephone: (415) 977-6500

CERTIFIED MAIL RETURN RECEIPT REQUEST NO. P-566 422 641

April 19, 1988

Ms. Linda Wakefield
Schnitzer Investment Corp.
3200 N.W. Yeon Avenue
Portland, OR 97210

APR 28 1988
Superfund Branch

Subject: 6501 NW Front Avenue Property.
Operated by Liquid Air Corporation

Re: NL/Gould Superfund Site, Portland, Oregon
EPA 104 (e) Request for Information
HW-113 Dated February 18, 1988

Dear Ms. Wakefield:

In response to your telephone request on or about March 2, 1988 regarding the above-referenced matter, this letter provides information relative to the facility operated by Liquid Air and leased from Schnitzer Investment Corporation located at 6501 NW Front Avenue in Portland, Oregon. As you know, Liquid Air Corporation has not independently received any request for information from EPA. This letter is being supplied to you as an accommodation.

1. To the best of our knowledge, Liquid Air Corporation has not generated, stored, treated, transported, disposed or otherwise handled any hazardous substance, as defined under Section 101(14) of CERCLA, at the NL/Gould Superfund site.

2. Liquid Air Corporation has not conducted any activities or operations at the NL/Gould Superfund site.

3. Liquid Air Corporation has no information regarding spills of hazardous substances on or around the site. However, by way of information, we understand that Area 1, located on the Schnitzer Investment property (Exhibit A) was periodically flooded by high waters coming from other adjacent properties, until 1982 when Area 1 was regraded. It has been reported that battery casings and gas cylinders were observed in the floodwater from other adjacent properties.

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4. Exhibit B, (pp 2-5), attached hereto, is a copy of "Agreement With Respect to Sampling and Monitoring" executed by Schnitzer Investment Corp., Liquid Air Corporation, Gould Inc. and NL Industries granting permission to EPA to conduct the environmental sampling and monitoring activities described in the RI/FS Work Plan dated March 31, 1988, submitted to USEPA Region X by Dames & Moore, consultants to Gould and NL. The sampling and monitoring described therein was to have been performed at the location identified as "approx. location of subsurface soil & ground water (sic) samples" in Figure 1, shown on page 5 of Exhibit C.

   Liquid Air does not have any results from the sampling and monitoring described above.

5. Liquid Air Corporation has no information on wells on the NL/Gould site.

6. There is one 1500 gallon capacity underground tank containing acetone on the Schnitzer Investment Corporation property leased by Liquid Air Corporation at 6301 NW Front Avenue. This is a single wall steel tank, not cathodically protected or (FRP) wrapped, located on the southern side of the acetylene plant building, as shown on Exhibit A. The tank was installed prior to 1969. There is no leak detection or other monitoring system installed for the tank.

   There are no other underground tanks on the property.

7. Because there are no indications that Liquid Air Corporation generated, stored, treated, transported, disposed or otherwise handled any hazardous substance at the NL/Gould site, Liquid Air Corporation finds this question burdensome and respectfully declines to respond.

We trust that the foregoing information is satisfactory for your needs in this matter.

Sincerely,

David E. Simon
Manager Regulatory Affairs

DES/je
Att: Exhibits A & B

cc: J. Baird, Esq.

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The appearance of some of the images following this page is due to

Poor Quality Original Documents

and not the scanning or filming processes.

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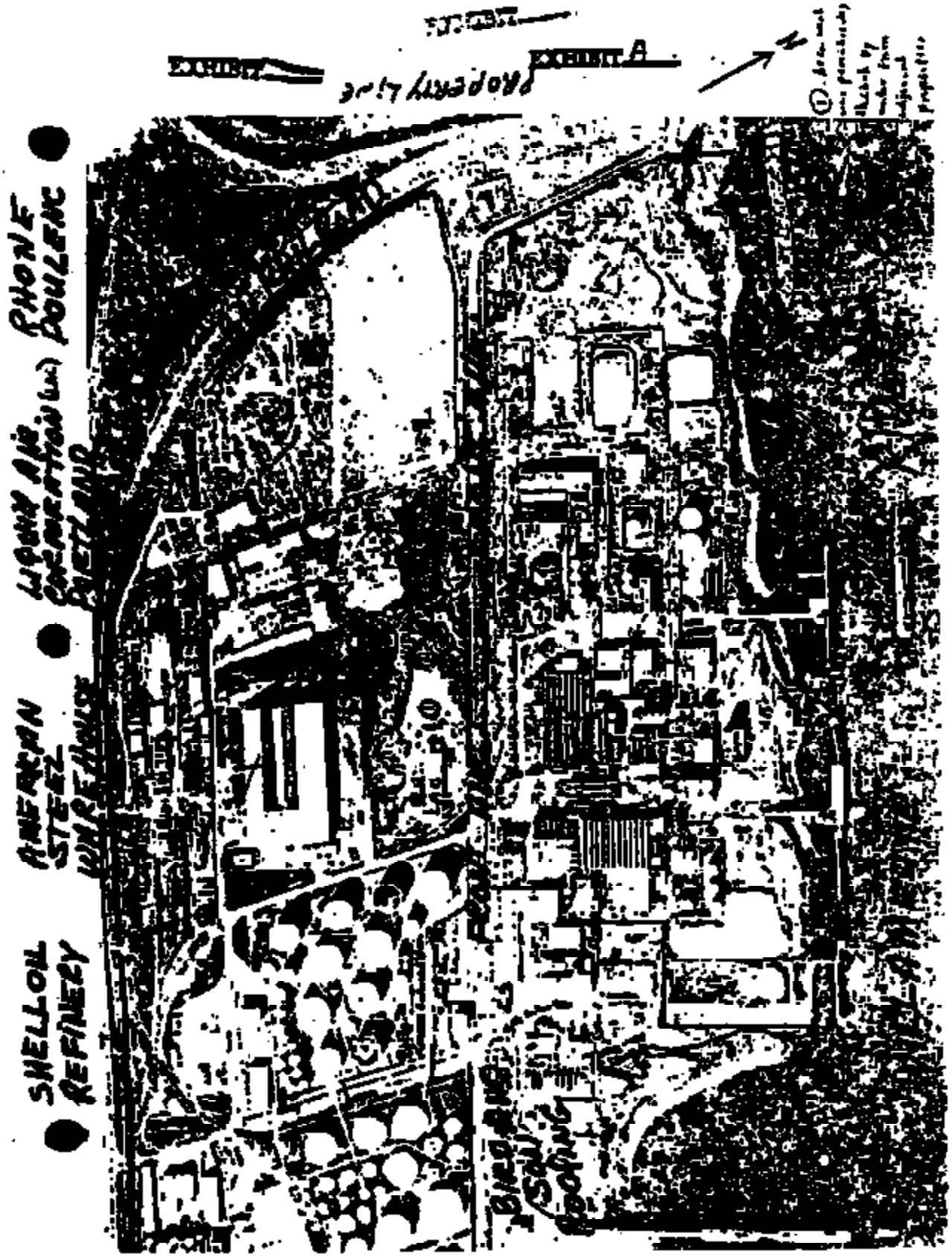

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FILE

LAW OFFICES OF
PRESTON, THORGRIMSON, ELLIS & HOLMAN

EXHIBIT 6 (10/24)

January 16, 1987

Patricia Cirone-Storm, Ph.D.
Superfund Site Manager
U.S.E.P.A. - Region 10
1200 Sixth Avenue
Seattle, Washington 98101

RECEIVED
Legal

Re: Gould/NL Superfund Site

Dear Ms. Cirone-Storm:

Enclosed is an Agreement With Respect To Sampling And Monitoring which has been duly executed by Schnitzer Investment Corp, Liquid Air Corporation, Gould, Inc., and NL Industries, Inc. This agreement provides for certain environmental sampling and monitoring activities to be performed on property located at 6501 N.W. Front, Portland, Oregon.

This agreement calls for execution by the United States Environmental Protection Agency. Please have the agreement signed by the appropriate official, and make the agreement effective as of the date of such signature.

I request that after this agreement has been signed by the Environmental Protection Agency I be provided with a copy of the fully executed agreement. I will then provide copies to the other signatories.

Please contact me if you have any questions about this agreement.

Very truly yours,

Mark C. Retzlick

MCR:ep
cc: Kathleen A. Brown
Michael C. Veysey
Janet D. Smith

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EXHIBIT 6 (20f24)

AGREEMENT WITH RESPECT TO
SAMPLING AND MONITORING

Schnitzer Investment Corp. ("Schnitzer"), Liquid Air Corporation ("Liquid Air"), Gould Inc. ("Gould") and NL Industries, Inc. ("NL") by and through their duly authorized representatives, hereby agree as follows:

1. Schnitzer and Liquid Air hereby grant to the United States Environmental Protection Agency ("USEPA") and/or its authorized representatives, and to Gould and NL and their contractors and subcontractors retained directly or indirectly, permission to conduct the environmental sampling and monitoring activities described in the Remedial Investigation and Feasibility Study Work Plan dated March 31, 1986 which was submitted to USEPA, Region 10 by Dames and Moore, consultants to Gould and NL. Such sampling and monitoring shall be conducted on property located at 6501 N.W. Front, Portland, Oregon and presently occupied by Liquid Air (hereafter the "Property") and shall be performed only at the location identified as "Approx. location of subsurface soil & ground water samples" in Figure 1 annexed hereto. The Property is located near or adjacent to a federal Superfund site located at 5909 N. W. 61st Avenue, Portland, Oregon.

All sampling and monitoring on the Property shall be carried out in accordance with the following terms and conditions:

A. Access to the Property under this agreement shall be limited to 8:00 a.m. to 5:00 p.m. and shall exclude all weekends and holidays. All activities will be

EXHIBIT 6 (3 of 24)

conducted in a reasonable manner so as to ensure that they do not interfere with Liquid Air's business operations at the Property or with Schnitzer's use and enjoyment of the Property. Prior to entering the Property, consent shall be obtained from authorized representatives of Schnitzer and Liquid Air.

B. A copy of all data and test results obtained from tests conducted on the Property will be sent to Schnitzer and Liquid Air within five (5) days of receipt by USEPA.

C. All wells drilled on the Property will be closed in an environmentally sound manner.

D. All contractors and subcontractors operating on the Property shall obtain and maintain at their own cost and expense property and personal insurance coverage in appropriate and adequate amounts as warranted by their activities on the property.

E. Gould and NL hereby agree to indemnify and hold Schnitzer and Liquid Air harmless from any loss, cost, damage or injury, of any kind whatsoever, resulting directly or indirectly from any entry onto the Property by USEPA, Gould, NL, their contractors, subcontractors, agents and representatives or from sampling or monitoring carried out on the Property.

F. It is Schnitzer's position that Gould and NL are liable to Schnitzer for all attorney's and consultant's fees which have been or will be incurred by Schnitzer in connection with the sampling and monitoring to be

conducted on the Property. Gould and ML deny that any such liability exists. The parties agree to reserve their rights regarding such liability, and further agree that nothing in this Agreement shall waive or modify in any way the rights of the parties regarding such liability.

This Agreement shall be effective as of this _____ day of October, 1985.

EXHIBIT 6(4 of 34)

SCHNITZER INVESTMENT CORP.

By:
Title: Vice Pres.

LIQUID AIR CORPORATION

By:
Title: Secretary

GOULD INC.

By:
Title:

ML INDUSTRIES, INC.

By:
Title:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

By:
Title:

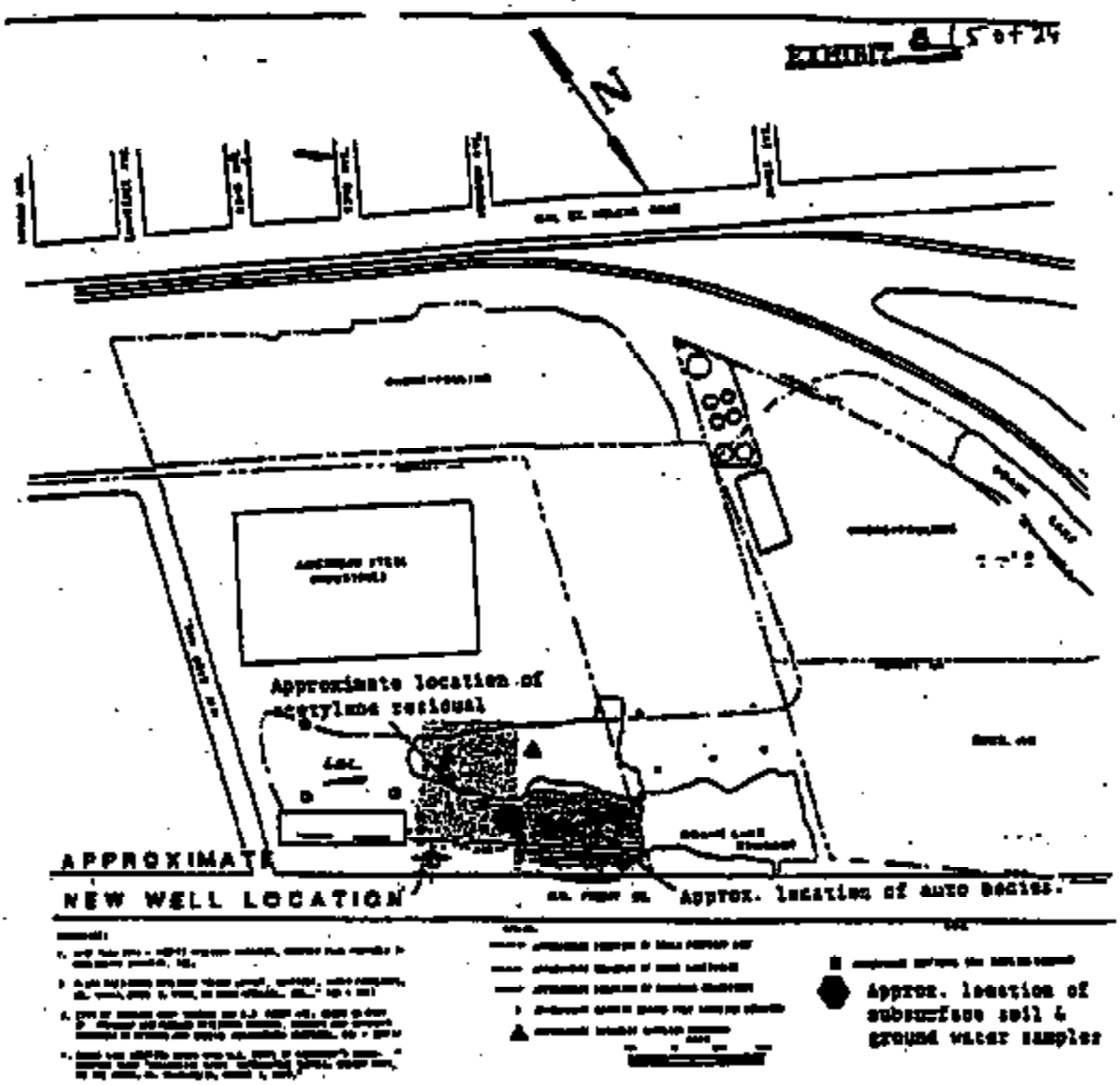

Figure 1

DRAWN BY	CHECKED BY	IMPACT ANALYSIS The Liquid Air Company	APPROVED	Century West Engineering
PREP BY	SCALE		DATE	
WORK BY	DWG NO			

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EXHIBIT E (6 of 24)

December 15, 1986

Mark C. Rutzick
PRESTON, THORGRIMSON,
ELLIS & HOLMAN
2000 I.B.M. Building
PO Box 2927
Seattle, Washington 98111

Re: Your Client: Schnitzer Investment Corp.
EPA Subsurface and Ground Water Samples
- Portland, OR

Dear Mr. Rutzick:

Pursuant to your letter of December 5, 1986, enclosed please find Agreement with Respect to Sampling and Monitoring which has been executed by Liquid Air Corporation. After execution by the Environmental Protection Agency, please provide me with a fully executed copy for my files.

Thank you for your assistance in this matter. Should you have any questions, please feel free to contact me.

Yours very truly,

Kathleen A. Brown
Paralegal
General Counsel's Office

KAB:vae

FILE (at least Portland G.W. File)

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Schn - 00503

PRESTON, THORGRIMSON, ELLIS & HOLMAN

December 5, 1986

EXHIBIT 6 (7 of 24)

RECEIVED
DEC 12 1986

Ms. Cathy Brown
Liquid Air Corporation
Legal Department
2121 N. California Boulevard
Walnut Creek, California 94596

Dear Ms. Brown:

Enclosed is the Agreement With Respect To Sampling And Monitoring regarding the property leased by Liquid Air Corporation from Schnitzer Investment Corp. in Portland, Oregon which is adjacent to the Gould/NL Superfund site. This agreement has been executed by Gould and NL. Upon execution by Liquid Air Corporation, I will have the agreement executed by Schnitzer Investment Corp. and forwarded to the Environmental Protection Agency.

The agreement as executed by Gould and NL contains references on pages 1 and 3 to "Liquid Air Disposal, Inc." You have informed me that the proper name for your company is "Liquid Air Corporation." I have therefore changed the two references in the agreement to state the correct name of your company.

By copy of this letter, I am informing Gould and NL of these changes to the agreement. There is no substantive change to the agreement in any manner.

Feel free to contact me if you have any questions about the agreement. My understanding from our previous conversation is that Liquid Air Corporation will be able to execute this agreement as presently drafted.

Very truly yours,

Mark C. Rutzick

MCR:cp
cc: Michael C. Veysey
Patricia Cirone-Storm, Ph.D.
Janet D. Smith

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LAW OFFICES OF
PRESTON, THORGRIMSON, ELLIS & HOLMAN

November 17, 1986

EXHIBIT 8 (8 of 24)

Mr. Michael C. Veysey
Assistant General Counsel
Gould, Inc.
10 Gould Center
Rolling Meadows, Illinois 60008

FILE (All Legal Portland (Fro

Re: Gould/NL Portland Superfund Site

Dear Mr. Veysey:

On October 31, 1986, engineers from Damas & Moore and Century Environmental Sciences met at the Liquid Air site to stake the location of a well.

I have now revised the Agreement With Respect To Sampling And Monitoring to specify the location of the well as being that which was staked on October 31, 1986, and is described in Figure 1 which is now attached to the Agreement.

You and Janet Smith previously executed the earlier draft of the Agreement. However, since it has been changed, I am forwarding an unexecuted copy of the revised Agreement, and am asking you to sign the Agreement, forward it to Janet Smith for her signature, and return it to me at your earliest convenience.

I have had no response from Liquid Air to my letter of October 14, 1986. I will make another effort to obtain their signature on the Agreement. However, Schnitzer Investment Corp. will not delay its execution of the Agreement if Liquid Air fails to respond.

Very truly yours,

Mark C. Retzick

MCR:sp
Enclosure
cc: Patricia Cirone-Storm, Ph.D.
Bradley R. Marten
John DeLong

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LAW OFFICES OF
PRESTON, THORGRIMSON, ELLIS & HOLMAN

October 14, 1986

EXHIBIT 8 (9 of 24)

RECEIVED OCT 22 1986

Mr. John DeLong
Liquid Air Disposal, Inc.
3130 N.W. Yeon Avenue
Portland, Oregon 97210

Except for the name, agreement looks O.K. — I suppose we have duty to cooperate if Schnitzer requests

Dear Mr. DeLong:

This firm represents Schnitzer Investment Corp., the lessor of the property you lease at 6501 N.W. Front Avenue in Portland. As you probably know, Schnitzer has recently been involved in negotiations with Gould, Inc., and NL Industries, Inc., regarding a request by Gould and NL to enter upon the property at 6501 N.W. Front Avenue for the purpose of conducting environmental sampling and monitoring activities in connection with the planned clean-up of the adjacent Gould property, which has been designated as a Superfund site by the Environmental Protection Agency.

After lengthy negotiations, Schnitzer has tentatively agreed with Gould and NL Industries regarding the terms of an agreement with respect to sampling and monitoring. Schnitzer believes that Liquid Air Disposal, Inc., should be a signatory to this agreement since the agreement involves entry upon the land your company occupies, and could involve some disruption to your activities.

Accordingly, I am enclosing a copy of the tentative Agreement With Respect To Sampling And Monitoring for review by Liquid Air. For background information, I am also enclosing some correspondance between Schnitzer and Gould/NL relating to the negotiation for this agreement.

The Environmental Protection Agency wants the agreement signed as soon as possible so that the clean-up at the Gould site can begin. Therefore, we would be grateful if you could use your best efforts to expedite review of this agreement by your company, and to advise me as soon as possible if your company will sign the agreement as presently drafted. If your company believes that any changes

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EXHIBIT G (10 of 24)

are required in the agreement, please advise me at your earliest convenience.

Those who review this agreement on behalf of your company should feel free to contact me at any time to obtain further information about the agreement.

Very truly yours,

Mark C. Nutzick

MCR:cp
cc: Patricia Cirone-Storm, Ph.D.
Roger Nau
Bradley M. Marten
Michael C. Veysey

LAW OFFICES OF
PRESTON, THORGRIMSON, ELLIS & HOLMAN

October 10, 1986

HAND DELIVERED

EXHIBIT B(11 of 34)

Patricia Cirone-Storm, Ph.D.
Barbara Lither, Esq.
Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, WA 98101

Re: Gould/NL Superfund Site

Dear Dr. Storm and Ms. Lither:

Schnitzer Investment Company, Gould and NL Industries have reached agreement on access to Schnitzer's property. Under the agreement, Schnitzer will reserve its rights against Gould and NL to pursue reimbursement for consulting costs and attorney's fees.

PRESTON, THORGRIMSON,
ELLIS & HOLMAN

By Bradley M. Marten

BMM:sm
cc: Michael Veysey
Janet Smith
Mark Rutzick
Roger Nen
10LBMM/08

RECEIVED

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LAW OFFICES OF
PRESTON, THORGRIMSON, ELLIS & HOLMAN

October 10, 1986

EXHIBIT 8 (12 of 34)

Mr. Michael C. Veysey
Assistant General Counsel
Gould, Inc.
10 Gould Center
Rolling Meadows, Illinois 60008

Re: Gould/NL Portland Superfund Site

Dear Mr. Veysey:

Enclosed is a new draft of the proposed access agreement which reflects our agreement of this morning to deal with the issue of reimbursement for attorney's and consultant's fees through a reservation of rights by the parties.

Please advise me as soon as possible whether Gould and NL will execute this agreement as drafted.

I also plan to provide a copy of this agreement, along with background correspondence, to Liquid Air Disposal, Inc., in order to obtain its signature on the agreement.

Very truly yours,

Mark C. Rutzick

MCR:cp
cc: Patricia Cirone-Storm, Ph.D.
Roger Neu
Bradley M. Marten

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PRESTON, THORGRIMSON, ELLIS & HOLMAN

October 3, 1986

EXHIBIT 6 (13 of 24)

HAND DELIVERED

Patricia Cirone-Storm, Ph.D.
Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, WA 98101

Re: Gould/NL Superfund Site, Portland, Oregon

Dear Ms. Storm:

I am writing to report to you on the status of the negotiations between Schnitzer, Gould and NL concerning site access to the Schnitzer property adjacent to the Gould/NL Superfund site. Schnitzer is doing everything possible to provide EPA with the access it seeks while still protecting its property rights. We have reached agreement on the location of the sampling, after a successful meeting between Damar & Moore and Century West, Schnitzer's consultant. We are also attempting to expedite an agreement with Gould and NL. As you know, Schnitzer wrote to Gould on September 23, 1986, with proposed revisions to Gould's access agreement. Gould took a week to respond to this letter, and only responded after both EPA and Schnitzer called Gould directly. On the day Schnitzer received Gould's response (September 30, 1986), Schnitzer sent an immediate response to Gould's letter. As you will see from this exchange of correspondence (copies attached), Schnitzer and Gould have agreed on virtually all terms, with the exception of payment of the consulting and attorney's fees Schnitzer has incurred as a consequence of Gould's discharge of contaminants. Notwithstanding the contrary position that Gould (and to some extent, EPA) has taken, there is clear Ninth Circuit authority which entitles Schnitzer to recover these costs. See, Wickland Oil Terminals v. Asarco, Inc., 792 F.2d 887, 893 (9th Cir. 1986). We expect that Gould is reanalyzing its position in light of the Wickland Oil case and will respond favorably to our request for reimbursement.

Schnitzer has not received a response from Gould to its September 30, 1986 letter, despite repeated phone calls, including one this morning. Gould has indicated, however, that it would like to consult with NL Industries as to its position

6 042775

EXHIBIT 2 (14 of 24)

and that it will respond to Schnitzer early next week. A copy of Schnitzer's letter to Gould confirming this arrangement is enclosed.

Schnitzer is mindful of EPA's need to obtain access to the property as soon as possible. We believe we are far enough along in our negotiations with Gould that an agreement on access can be reached without EPA intervention and that any such intervention would delay EPA's access to the property. We will keep you advised of the progress of our discussions with Gould, and I will call you next week to report on our status.

PRESTON, THORGRIMSON,
ELLIS & HOLMAN

By Brad Marten
Bradley K. Marten

BKM:mm
Enclosures
cc: Barbara Lither, Esq.
Roger Nye
1013MM/03

G 042776

LAW OFFICES OF
PRESTON, THORGRIMSON, ELLIS & HOLMAN

October 3, 1986

EXHIBIT G (15 of 14)

Mrs. Clarel A. Krpan
Assistant to Michael C. Veysey
Assistant General Counsel
Gould Electronics
10 Gould Center
Rolling Meadows, Illinois 60008

Re: Gould/NL Portland Superfund Site

Dear Mrs. Krpan:

To confirm our telephone conversation of this morning, you advised me that Gould would like to consult with NL Industries prior to responding to my letter to you of September 30, 1986. You indicated that we would be hearing from Gould and NL sometime early next week.

Schnitzer Investment Corp. remains eager to resolve this matter and to reach agreement with Gould and NL Industries as soon as possible.

I have taken the liberty of sending a copy of this letter to the Environmental Protection Agency in Seattle so that they remain aware of the current state of our discussions.

Very truly yours,

Mark C. Rutzick

MCR:cp
cc: Patricia Cirone-Storm, Ph.D.
Ms. Barbara Lither

G 042777

LAW OFFICES OF
PRESTON, THORGRIMSON, ELLIS & HOLMAN

September 30, 1986

EXHIBIT 6 (16 of 24)

Mrs. Clarel A. Krpan
Assistant to Michael C. Veysey
Assistant General Counsel
Gould Electronics
10 Gould Center
Rolling Meadows, Illinois 60008

Re: Gould/NL Portland Superfund Site

Dear Mrs. Krpan:

Thank you for your letter of September 30, 1986, which responded to my letter to you of September 23, 1986.

With regard to your comments, I will respond in the order of the points you raised.

1. I do not believe that one individual can be authorized to coordinate on behalf of both Schnitzer and Liquid Air. Schnitzer does not feel it is appropriate to permit an individual from Liquid Air to act on behalf of Schnitzer, and Schnitzer is unwilling to accept the risk and possible exposure of acting on behalf of Liquid Air. Therefore, each company must be consulted separately. In practice, I am sure that this can be done very conveniently.

2. We will accept insurance in "appropriate and adequate amounts."

3. Your interpretation of 42 U.S.C. § 9607(2),(4)(B) is incorrect. The United States Court of Appeals for the Ninth Circuit has recently held that the costs incurred by a private party in investigating and testing for the presence of hazardous substances is recoverable under 42 U.S.C. § 9607(a)(2)(B) even without any government approval. Wickland Oil Terminals v. Asarco, Inc., 792 F.2d 887, 892 (9th Cir. 1986). The Court specifically held that investigatory and testing expenses are recoverable even where the

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EXHIBIT 6 (17 of 134)

party incurring these expenses has not incurred any actual, on-site clean-up costs. This is precisely the situation in which Schnitzer finds itself today. The Wickland Oil Terminals case is direct, controlling authority in support of Schnitzer's position that Gould and NL Industries are liable to Schnitzer for the costs it has incurred in connection with the clean-up of the contaminated Gould/NL site.

4. The fact that Gould and NL may have incurred additional expenses for contractors is entirely the fault of Gould and NL. We have no idea why Gould and NL hired contractors and brought them to the site of the Schnitzer property without first obtaining Schnitzer's agreement to allow the contractors to enter upon the property. It would have been more appropriate to obtain Schnitzer's consent before bringing the contractors to the site.

Schnitzer Investment Corp. hopes to be able to execute an agreement with Gould and NL Industries in the very near future so that this matter may proceed expeditiously to achieve the necessary clean-up of the Gould/NL site. Frankly, we feel it is quite regrettable that Gould has chosen to attempt to portray Schnitzer as the "bad guy" with the Environmental Protection Agency when Schnitzer's only interest from the beginning was to understand what was being asked of it and to make an informed evaluation of a very complex situation with which Schnitzer has had no previous familiarity.

I look forward to hearing from you as soon as possible so that agreement may be reached by the end of this week if at all possible.

Very truly yours,

Mark C. Rutzick

MCR:cp
Enclosure
cc: Patricia Cirone-Storm, Ph.D.
Ms. Barbara Zither

GOULD
Electron

September 30, 1986

Mark C. Rutzick, Esq.
Preston, Thorgrimson, Ellis & Holman
1210 S.W. 1st Avenue, Suite 300
Portland, Oregon 97204

Re: Gould/NL Portland Superfund Site

Dear Mr. Rutzick:

I am in receipt of your revised version of the Agreement with Respect to Sampling and Monitoring which accompanied your letter of September 23, 1986. Your addition of Liquid Air Disposal, Inc. as a signatory seems appropriate. However, is it necessary that all activities be coordinated with representatives of both Schnitzer and Liquid Air? In the interest of efficiency, could one individual be authorized to coordinate on behalf of both?

Regarding paragraph D of your proposed Agreement we wish to substitute the words "appropriate and adequate amounts" for your wording of "the amount of $5 million or such higher appropriate amount".

Concerning paragraph I of your proposed Agreement, NL agrees to indemnify along with Gould. We do not, however, consider the attorney's fees and/or consultant's fees incurred by Schnitzer Investment Corp. as being "necessary costs" under 42 U.S.C. 9607(4)(B). Those sums were expended voluntarily and not as a necessary response to this situation. They were done for Schnitzer's and/or Liquid Air's own information and use.

As a matter of fact, Gould and NL will incur additional expense due to the length of time we have spent attempting to gain access to Schnitzer's property. My first conversation with Fred Rusina regarding this issue was on July 11, 1986, and because of the fact that we have not been able to gain access to the property as yet, our contractors had to remove their equipment from the vicinity. It will be necessary for them to bring drilling equipment, etc., back to perform the necessary procedures on this property.

G 042750

EXHIBIT G (19 of 24)

We are very anxious to resolve this and accomplish the activities we are bound to perform under the Consent Order entered into with the USEPA. Please let us know as soon as possible if you accept the changes in the Agreement which are suggested above.

Sincerely,

Clarel A. Krpan

(Mrs.) Clarel A. Krpan
Assistant to Michael C. Veysey
Assistant General Counsel

cc: Mark Anderson (Dames & Moore)
Fred R. Bauer (NL)
Janet D. Smith (NL)
Patricia C. Sturm (USEPA)
Barbara J. Lisher (USEPA)

LAW OFFICES OF
PRESTON, THORGRIMSON, ELLIS & HOLMAN

September 23, 1986

EXHIBIT

Mrs. Clarel A. Krpan
Assistant to Michael C. Veysey
Assistant General Counsel
Gould Electronics
10 Gould Center
Rolling Meadows, Illinois 60008

EXHIBIT 8 (20 of 24)

Re: Gould/NL Portland Superfund Site

Dear Mrs. Krpan:

Enclosed is a revised version of the Agreement With Respect To Sampling And Monitoring for the property owned by Schnitzer Investment Corp. which is next to the contaminated property owned by Gould, Inc. at 5900 N.W. 61st Avenue, Portland, Oregon. The agreement in the form enclosed is acceptable to Schnitzer Investment Corp.

The agreement has been revised from the draft you previously provided to Fred Rusina. First, this agreement includes Liquid Air Disposal, Inc., as a signatory to the agreement. As the lessee of the Schnitzer Investment Corp. property, Liquid Air should be included in the agreement. Second, the indemnity provision (paragraph E) has been slightly revised. Third the agreement is modified to reflect that Gould, Inc., and NL Industries, Inc., will indemnify Schnitzer Investment Corp. for its attorney's and consultant's fees which have been or will be incurred in connection with the proposed sampling and monitoring program on the Schnitzer Investment Corp. property.

Payment of these attorney's and consultant's fees is a liability of Gould and NL under 42 U.S.C. § 9607(4)(B), which imposes on the responsible party at a Superfund site "any other necessary costs of response incurred by any other person consistent with the national contingency plan." The attorney's and consultant's fees incurred by Schnitzer Investment Corp. in this instance are "necessary costs of response" by Schnitzer Investment Corp. to the release of

G 042782

EXHIBIT 6(2) of 14)

hazardous substances on the Gould/NL Superfund site. The term "response" under 42 U.S.C. § 9601(25) includes removal, and the term "removal" under 42 U.S.C. § 9601(23) includes "such actions as may be necessary to monitor, assess, and evaluate the release or threat of release of hazardous substances." The attorney's and consultant's fees incurred by Schnitzer Investment Corp. are necessary for it to "monitor, assess, and evaluate" the actual release of hazardous substances by Gould at the Gould/NL site.

We would be happy to itemize for you the attorney's and consultant's fees incurred to date. We would like these fees paid at the time the enclosed agreement is executed. We will bill you periodically thereafter for such additional fees as may be subsequently incurred.

Schnitzer Investment Corp. intends to cooperate fully with the Environmental Protection Agency and with Dames & Moore to facilitate the clean-up of your contaminated property. Schnitzer Investment Corp.'s consultant, Century Environmental Sciences, is proceeding to work closely with Dames & Moore on the technical and operational aspects of the sampling and monitoring program on the Schnitzer property. We are hopeful that Gould, Inc., will also be cooperative so that the necessary sampling and monitoring can proceed at once with full adherence to the conditions and liabilities imposed by law.

Very truly yours,

Mark C. Rutzick

MCR:cp
Enclosure
cc: Patricia Cirone-Storm, Ph.D.
Century Environmental Sciences
Ms. Barbara Lither
Roger Neu, Vice-President
Schnitzer Investment Corp.

6 042783

File
LAI Lease
6501 NW Fron
Portland

EXHIBIT 6 (22 of 24)

November 11, 1985

CERTIFIED MAIL/RETURN
RECEIPT REQUESTED

Gould Electronics
Two Gould Center
Rolling Meadows, Illinois 60008

Attn: Michael C. Veysey
Business Section - Legal Counsel

Dear Mr. Veysey:

Thank you for your letter of October 4, 1985. Please be advised that Liquid Air Corporation currently operates two facilities in the Portland area; office space at 3300 N.W. Yeon and an Acetylene Plant at 6501 N.W. Front. Both of these properties are not owned by Liquid Air; they are leased from Schnitzer Investment Corporation. Therefore, Liquid Air Corporation cannot comply with your request to consent to soil, water and air sampling.

By copy of this letter to Linda Wakefield, Property Manager for Investment Corporation, I am attaching a copy of your October 4 letter for Schnitzer's review and response.

Should you have any questions, please contact Ms. Wakefield directly at (503) 2[illegible]4-9000.

Very truly yours,

Kathleen A. Brown
Paralegal

[illegible]
encls.

cc: Linda Wakefield
Schnitzer Investment Corporation
3200 N. W. Yeon Avenue
P. O. Box 10047
Portland, OR 97210

G 042784

Schn - 00519

Gould Inc.
10 Gould Center Rolling M...
Telephone (312) 640-4000

GOULD
Electronics

October 4, 1985

CERTIFIED MAIL/RETURN RECEIPT REQUESTED

EXHIBIT 6 (1 of 2)

Plant Manager
Liquid Air Corporation
2330 N.W. Yeon Avenue
Portland, Oregon 97210

Dear Sir:

Gould Inc. and NL Industries, Inc. are performing a remedial investigation and feasibility study at the Gould site located at 5909 N.W. 61st Avenue, Portland, Oregon. The remedial investigation and feasibility study may include, in general terms, groundwater, soil and air sampling on the Gould site and its environs. These activities are being conducted pursuant to the Administrative Order on Consent entered into by the U.S. Environmental Protection Agency (EPA), Gould Inc. and NL Industries, Inc.

The area in the vicinity of the site where investigatory activities may occur includes your property. The nature of the anticipated investigations may include the following types of activities: (1) the placement and use of air monitoring instruments; (2) the collection of soil samples and/or soil borings; and (3) the monitoring of groundwater by sampling existing wells or installing new wells to be sampled.

Gould and NL hereby request permission for their authorized employees and/or contractors and EPA to enter your company's property to conduct necessary samplings and monitoring. Notice will be given to you in advance of the initial sampling.

After you have reviewed the enclosed consent form, please have the appropriate person execute the document and return it to me at your earliest convenience.

Thank you for your assistance and attention to this request. Please contact me at (312) 640-4716 if you require further information.

Sincerely,

Michael C. Vayssy

Michael C. Vayssy
Business Section Legal Counsel

MCV/cak

Enclosure

RECEIVED

G 042785

EXHIBIT 6 (24 of 24)

CONSENT TO SAMPLING AND MONITORING

Liquid Air Corporation, by and through its duly authorized representative, does hereby grant to United States Environmental Protection Agency and/or its authorized representatives and Gould Inc. and NL Industries, Inc. and their contractors and subcontractors retained directly or indirectly, permission to conduct sampling and monitoring activities at

This sampling program is being done pursuant to the Administrative Order on Consent entered into by the United States Environmental Protection Agency, Gould Inc. and NL Industries, Inc.

LIQUID AIR CORPORATION

By:_____

Title:_____

SUBSCRIBED AND SWORN to before me this_____day of_____, 1988.

_____
Notary Public

6 042786

SCHNITZER INVESTMENT CORP.

3200 N.W. Yeon Ave. P.O. Box 10347 Portland, Oregon 97210 Phone 503/224-9900 Telex/W.U. 36-0144 FAX 503/323-2783

March 21, 1988

Mr. David Tretta (HW.113)
U.S. Environmental Protection Agency
Superfund Branch
1200 Sixth Avenue
Seattle, Washington 98101

Dear Mr. Tretta:

NL/GOULD PRP REQUEST DATED 2/18/88

We received the subject request from your office on February 23, 1988, and have reviewed our files to provide as thorough a response as possible at this time. It is important to note, however, that prior to 1982 the entire property was leased by the Liquid Air Company who now operate on the southeastern half of the parcel. Much of the activity related to your request was and is under their direct control. Liquid Air has informed us that staff cannot supply a response to your request in the allotted time. As a consequence, we have developed the following information with what is currently available to us and plan to update the information when we receive Liquid Air's input. You may wish to contact them directly as well.

Responses provided herein are based on a review of our files on the property; a preacquisition audit conducted in September, 1986; and a recent site inspection by our technical consultant, Mr. Gaynor Dawson of ICF Technology Inc.

1) What are the generic names and chemical character of the hazardous substances, as defined under Section 101(14) of CERCLA, that you generate, store, treat, transport, dispose, or otherwise handle or have handled at the site? Briefly describe the activities and operations that were carried out by you or your company which involved these hazardous substances.

As noted in the preamble, the primary activity on the property in question has been the operation of the Liquid Air facility. That operation is directed to the production of acetylene and the distribution of hydrogen and fuel quality propane. While none of these substances are currently defined as hazardous under Section 101(14) of CERCLA, acetylene production by the carbide process does produce a calcium hydroxide slurry which may qualify as a corrosive hazardous waste (when the pH >12.5) under Section 3001 of RCRA. Prior to 1980, these wastes were placed in Doane Lake where they settled and were dredged for reuse. By 1982, the excess lime had been removed and the settling pond was backfilled with clean fill. The disposition of the reclaimed lime and the potential for some residues to remain on site is not known to Schnitzer Investment Corp., but we believe that some lime-based

materials were left on the soil surface over much of the site as indicated in Figure 1.

As a part of Liquid Air's operation, they have maintained a 1,500 gallon storage tank for acetone. The acetone is used as a carrier in the acetylene cylinders. To the best of our knowledge, this tank is still in use.

Storage tanks are also maintained as a part of the hydrogen and propane distribution activities to provide surge capacity. These products arrive at the plant via pipeline and are then redistributed.

Additional materials stored on site for use are liquid nitrogen for refrigeration, compressor oils for the hydrogen compressors, and <500 pounds of calcium chloride as a desiccant. None of these materials are designated hazardous under Section 101(14) of CERCLA.

2) If you do not believe hazardous substances were handled at the site, please briefly describe the activities and operations that were carried out by you or your company.

As noted under the first response, calcium hydroxide sludges have been disposed at the site and depending on their pH at the time of disposal, they may or may not have qualified as hazardous. In addition, nonhazardous fluff from the shredding of autos for metals recovery has been placed on the site. Based on our current understanding, the pile was placed on top of previously disposed hydroxide wastes from Liquid Air. The approximate location of the shredder fluff is indicated in Figure 1.

Approximately 4,500 cubic yards of fill dirt and demolition waste from the Portland area was brought in under a permit from the City of Portland (File No. CU2-82) to backfill the abandoned Liquid Air settling pond.

In summary, Schnitzer activity at the site has consisted of placement of clean fill in the abandoned settling pond and storage/disposal of nonhazardous solid waste residues from auto shredding. All other activities are related to operation of the Liquid Air Company plant as described under Item No. 1.

3) For each hazardous substance identified above, please describe how the substance was handled, when, and the total quantity in weight or volume (estimate if quantity not available).

We have no information concerning the volume of calcium hydroxide by-product produced and/or disposed by Liquid Air. Presumably, that information will be forthcoming in their response. As noted in Item No. 1, we believe the sludge was routed to the settling pond from which it was ultimately reclaimed for sale. We also believe that some solid materials were spread across the site as indicated in Figure 1.

Currently, liquid calcium hydroxide by-product is collected in a sump near the acetylene reaction chamber and pumped to steel holding tanks. The product lime is then removed for reuse.

By virtue of the tank size, acetone inventories never exceed 1,500 gallons.

4) Where was this material stored and where was it disposed of?

The disposal area and the location of the acetone tank are indicated in Figure 1. Storage of the liquid calcium hydroxide is accomplished in steel tanks marked on the figure.

5) What arrangements (if any) were made to transport the hazardous substances away from the site? Who was the transporter of the hazardous substances and what is his current/previous address?

The reclaimed calcium hydroxide was sold for reuse. We are not aware of who Liquid Air sold this material to historically, or where they subsequently used it. Currently, we believe the lime is removed from the storage tanks by Chem-Lime, Incorporated.

6) Provide all information you have regarding spills of hazardous substances on or around the site. This should include the generic name and chemical constituents of the material(s) spilled, the quantity of material spilled, cleanup measures taken, the cause for the spill, and any other related information.

No spills of hazardous substances have occurred in conjunction with our operations on the site. Four operations at the Liquid Air facilities have the capacity to spill as follows:

1) <u>Overflow from the Compressor Blowdown Tank</u>

Oily materials contained in blowdown from the No. 1 hydrogen compressor is routed to a compressor blowdown tank located behind the compressor room. If this tank were to overflow, the oil could spill onto the surrounding soils.

2) Overflow from the Waste Oil/Water Separator

Waste oil from the No. 2 hydrogen compressor is collected and transferred into an oil/water separator located behind the No. 2 hydrogen compressor room. Oily waste from this separator could overflow onto the ground in the immediate vicinity of the separator and flow into a catchment basin which ultimately discharges into a sump and then Doane Lake. Waste oil from other compressors is dumped into a second catchment basin and routed to the same sump.

3) Overflow from the Cooling Water Tower

Overflow from the cooling water tower could flow onto the ground and into the same catchment basin as oil from the compressors. The basin discharges to the sump and then Doane Lake. Cooling water contains two proprietary additives: 1) MXT-1, a microbiocide; and 2) POSCA-25W, a nitrate-molybdate sequestrant. We have no information on the chemical makeup of these two additives.

4) Overflow from the Liquid Calcium Hydroxide Tanks

The liquid calcium hydroxide (lime) waste product from acetylene production is currently collected in a sump outside the acetylene generator room after flowing from the reaction chamber. The lime is then pumped to steel tanks where it is held until removal for reuse by Chem-Lime, Incorporated. The liquid calcium hydroxide could overflow the tanks into the ground and into the wastewater sump which discharges to Doane Lake.

All inquiries related to the above should be directed to Liquid Air.

7) Describe all environmental investigations that have taken place on or around your property/facility. This includes investigations of the physical and chemical characteristics of soil, surface water, sediments, air, and groundwater. This also includes historical evaluations of potential/known contamination. Provide all relevant information including, but not limited to, study design, work plans, quality assurance procedures, sampling procedures, well logs, study results, and data analysis. Raw data need not be provided at this time; data summaries will suffice.

Two environmental investigations have been conducted on the

Schnitzer property. The first was a preacquisition audit conducted in September, 1986. No samples were taken during that effort. Activity consisted of a walkthrough and review of operations at Liquid Air. The bulk of our knowledge of Liquid Air's operations stem from this investigation.

The second investigation was the RI for the NL/Gould site. Permission was granted for Gould's contractor, Dames & Moore, to install two groundwater monitoring wells on the site (Figure 1). We have not received detailed results from subsequent analyses, but have been provided an isocontour plot indicating lead levels are <0.02 mg/l and sulfate levels are <50 mg/l.

8) Provide all information on all wells on site including the number, locations, associated well logs, date of installation, purpose of installation, and whether the well(s) are being used currently and for what purpose.

There are five known wells on the property as indicated in Figure 1. The two Gould monitoring wells were installed by Dames & Moore as a part of the NL/Gould RI. These continue to be used for monitoring purposes. Of the three remaining wells, two are abandoned and one is still in use as a source of water for the acetylene production cooling tower (Permit No. G6015). The water is not distributed for potable use. The location of the well currently in use is shown in Figure 1. We are not certain at this time as to the exact location of the two abandoned wells.

9) Provide information regarding all underground storage tanks (see definition above) at the properties owned or leased by you or your company. Specifically, provide a list describing the location, age, construction, contents, and leak detection system or other monitoring systems for each tank. Provide a map showing the location of each tank and associated pipelines. Indicate if there are any underground storage tanks no longer in use on the properties.

To our knowledge, there is a single underground storage tank on the property, the 1,500 gallon acetone storage tank marked on Figure 1. This tank is constructed of steel and is served by galvanized steel pipes. The tank was installed new approximately 20 years ago and is not known to have leaked. Leak detection consists of stock inventory maintenance and analysis for water in the product. We are unaware of any overflow protection of external or internal corrosion prevention measures. We are not aware of any repair work on this tank or its appurtenances.

The liquid calcium hydroxide tanks are above ground constructs.

We are not aware of their piping arrangements, however, so they may fail the 10% rule and be classified as underground tanks. To the best of our knowledge they were not so registered by Liquid Air and we assume they, therefore, are entirely above ground.

10) Provide copies of all insurance policies that may provide liability coverage for damages resulting from releases of hazardous substances and/or hazardous wastes. This includes policies that are in effect as well as those effective when hazardous substances were released in the past.

We are currently reviewing our insurance coverage and cannot, at this time, identify the extent to which it would address damages resulting from releases of hazardous substances and/or hazardous wastes.

11) For responses under Item 4, 6, 7, 8, and 9 above, please provide a map which indicates relevant locations and depths.

All relevant features are identified in Figure 1.

Very truly yours,

Linda M. Wakefield
Vice President

LMW/ba

cc: Gaynor Dawson
Richard Bach
[redacted]

SI10000655

Schn - 00492

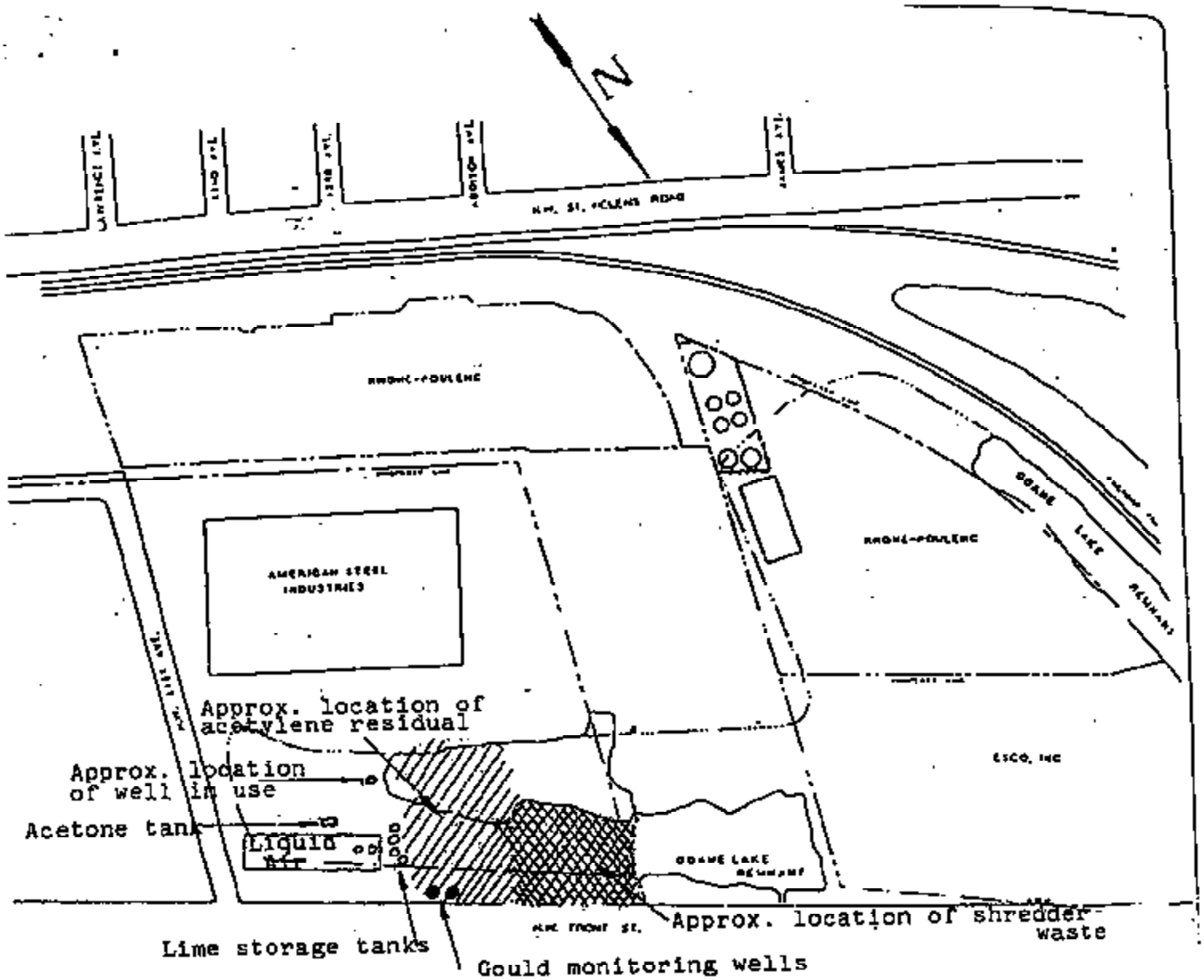

FIGURE 1. Relevant Features on the Schnitzer Property

SCHNITZER INVESTMENT CORP

[redacted]

April 26, 1988

Mr. David Tretta (HW.113)
U.S. Environmental Protection Agency
Superfund Branch
1200 Sixth Avenue
Seattle, Washington 98101

Re: NL/Gould PRP Request dated February 16, 1988

Dear Mr. Tretta:

Further to our response of March 21, 1988 to the referenced request, enclosed is a copy of the response we have received from Liquid Air Corporation.

Sincerely,

Linda M. Wakefield
Vice President

LMW:ws

Enclosure

cc: Gaynor Dawson
Mark Norford
Roger Neu

APR 28 1988

Superfund Branch

[redacted]

6 042759

LIQUID AIR CORPORATION
2121 N. California Blvd.
Walnut Creek, CA 94596
Telephone: (415) 977-8500

CERTIFIED MAIL RETURN RECEIPT REQUEST NO. P-565 422 641

April 19, 1988

Ms. Linda Wakefield
Schnitzer Investment Corp.
3200 N.W. Yeon Avenue
Portland, OR 97210

APR 28 1988

Superfund Branch

Subject: 6501 NW Front Avenue Property
Operated by Liquid Air Corporation

Re: NL/Gould Superfund Site, Portland, Oregon
EPA 104 (a) Request for Information
HW-113 Dated February 18, 1988

Dear Ms. Wakefield:

In response to your telephone request on or about March 2, 1988 regarding the above-referenced matter, this letter provides information relative to the facility operated by Liquid Air and leased from Schnitzer Investment Corporation located at 6501 NW Front Avenue in Portland, Oregon. As you know, Liquid Air Corporation has not independently received any request for information from EPA. This letter is being supplied to you as an accommodation.

1. To the best of our knowledge, Liquid Air Corporation has not generated, stored, treated, transported, disposed or otherwise handled any hazardous substance, as defined under Section 101(14) of CERCLA, at the NL/Gould Superfund site.

2. Liquid Air Corporation has not conducted any activities or operations at the NL/Gould Superfund site.

3. Liquid Air Corporation has no information regarding spills of hazardous substances on or around the site. However, by way of information, we understand that Area 1, located on the Schnitzer Investment property (Exhibit A) was periodically flooded by high waters coming from other adjacent properties, until 1982 when Area 1 was regraded. It has been reported that battery casings and gas cylinders were observed in the floodwater from other adjacent properties.

6 042760

4. Exhibit B, (pp 2-5), attached hereto, is a copy of "Agreement With Respect to Sampling and Monitoring" executed by Schnitzer Investment Corp., Liquid Air Corporation, Gould Inc. and NL Industries granting permission to EPA to conduct the environmental sampling and monitoring activities described in the RI/FS Work Plan dated March 31, 1986, submitted to USEPA Region X by Dames & Moore, consultants to Gould and NL. The sampling and monitoring described therein was to have been performed at the location identified as "approx. location of subsurface soil & ground water (sic) samples" in Figure 1, shown on page 5 of Exhibit C.

   Liquid Air does not have any results from the sampling and monitoring described above.

5. Liquid Air Corporation has no information on wells on the NL/Gould site.

6. There is one 1500 gallon capacity underground tank containing acetone on the Schnitzer Investment Corporation property leased by Liquid Air Corporation at 6501 NW Front Avenue. This is a single wall steel tank, not cathodically protected or (FRP) wrapped, located on the southern side of the acetylene plant building, as shown on Exhibit A. The tank was installed prior to 1969. There is no leak detection or other monitoring system installed for the tank.

   There are no other underground tanks on the property.

7. Because there are no indications that Liquid Air Corporation generated, stored, treated, transported, disposed or otherwise handled any hazardous substance at the NL/Gould site, Liquid Air Corporation finds this question burdensome and respectfully declines to respond.

We trust that the foregoing information is satisfactory for your needs in this matter.

Sincerely,

David N. Simon
Manager Regulatory Affairs

DNS/jm
Att: Exhibits A & B

cc: J. Baird, Esq.

dns/1/129-88

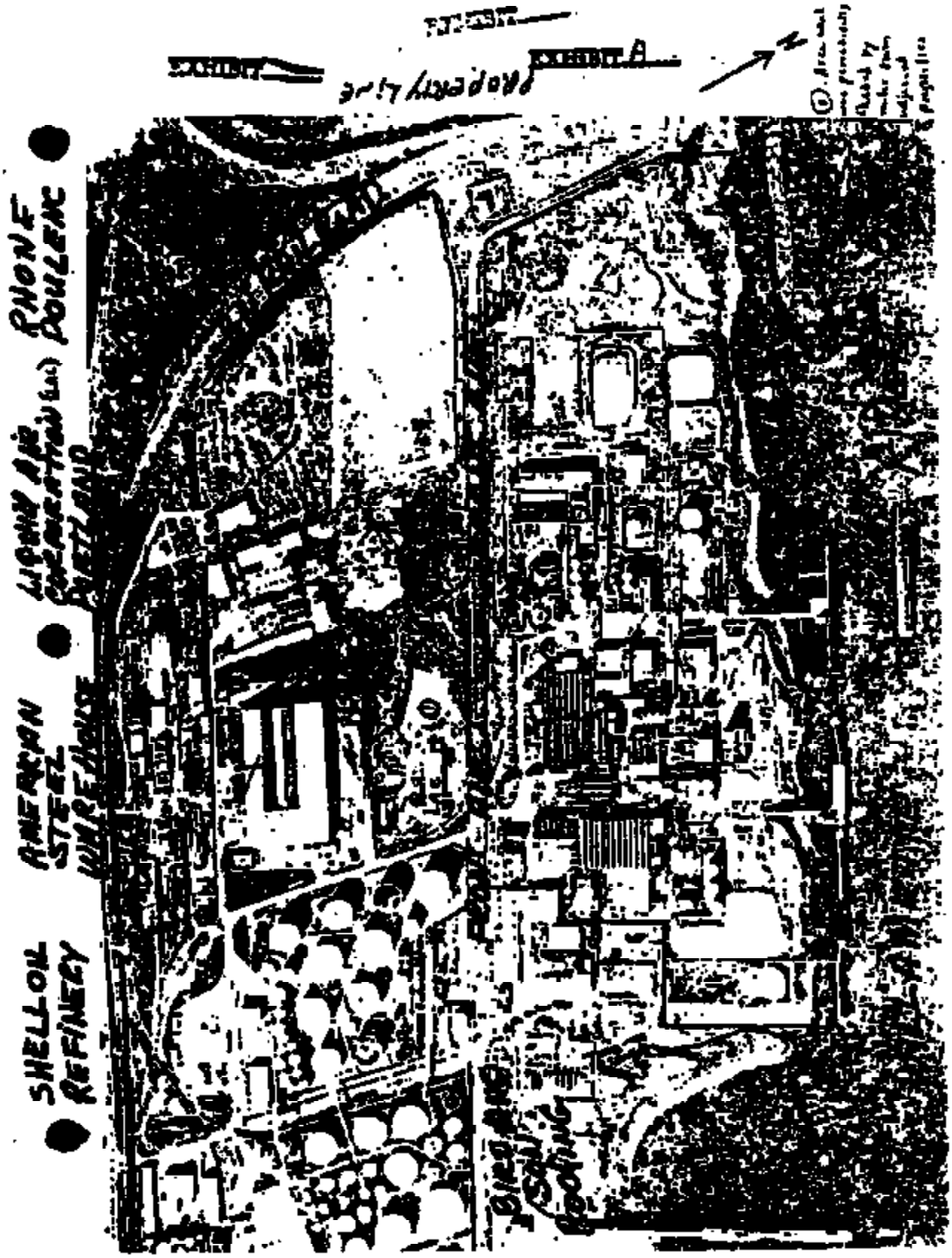
EXHIBIT A
PROPERTY LINE
RHONE POULENC
HIGHWAY 146
AMERICAN STEEL WAREHOUSE
SHELL OIL REFINERY

G 042762

FILE

LAW OFFICES OF
PRESTON, THORGRIMSON, ELLIS & HOLMAN

EXHIBIT B (1 of 24)

January 16, 1987

Patricia Cirone-Storm, Ph.D.
Superfund Site Manager
U.S.E.P.A. - Region 10
1200 Sixth Avenue
Seattle, Washington 98101

RECEIVED
JAN 22 1987
Legal

Re: Gould/NL Superfund Site

Dear Ms. Cirone-Storm:

Enclosed is an Agreement With Respect To Sampling And Monitoring which has been duly executed by Schnitzer Investment Corp, Liquid Air Corporation, Gould, Inc., and NL Industries, Inc. This agreement provides for certain environmental sampling and monitoring activities to be performed on property located at 6501 N.W. Front, Portland, Oregon.

This agreement calls for execution by the United States Environmental Protection Agency. Please have the agreement signed by the appropriate official, and make the agreement effective as of the date of such signature.

I request that after this agreement has been signed by the Environmental Protection Agency I be provided with a copy of the fully executed agreement. I will then provide copies to the other signatories.

Please contact me if you have any questions about this agreement.

Very truly yours,

Mark C. Retzick

MCR:cp
cc: Kathleen A. Brown
Michael C. Verney
Janet D. Smith

G 042763

EXHIBIT B (2 of 24)

AGREEMENT WITH RESPECT TO
SAMPLING AND MONITORING

Schnitzer Investment Corp. ("Schnitzer"), Liquid Air Corporation ("Liquid Air"), Gould Inc. ("Gould") and NL Industries, Inc. ("NL") by and through their duly authorized representatives, hereby agree as follows:

1. Schnitzer and Liquid Air hereby grant to the United States Environmental Protection Agency ("USEPA") and/or its authorized representatives, and to Gould and NL and their contractors and subcontractors retained directly or indirectly, permission to conduct the environmental sampling and monitoring activities described in the Remedial Investigation and Feasibility Study Work Plan dated March 31, 1986 which was submitted to USEPA, Region 10 by Dames and Moore, consultants to Gould and NL. Such sampling and monitoring shall be conducted on property located at 6501 N.W. Front, Portland, Oregon and presently occupied by Liquid Air (hereafter the "Property") and shall be performed only at the location identified as "Approx. location of subsurface soil & ground water samples" in Figure 1 annexed hereto. The Property is located near or adjacent to a federal Superfund site located at 5909 N. W. 61st Avenue, Portland, Oregon.

All sampling and monitoring on the Property shall be carried out in accordance with the following terms and conditions:

A. Access to the Property under this agreement shall be limited to 8:00 a.m. to 5:00 p.m. and shall exclude all weekends and holidays. All activities will be

conducted in a reasonable manner so as to ensure that they do not interfere with Liquid Air's business operations at the Property or with Schnitzer's use and enjoyment of the Property. Prior to entering the Property, consent shall be obtained from authorized representatives of Schnitzer and Liquid Air.

B. A copy of all data and test results obtained from tests conducted on the Property will be sent to Schnitzer and Liquid Air within five (5) days of receipt by USEPA.

C. All wells drilled on the Property will be closed in an environmentally sound manner.

D. All contractors and subcontractors operating on the Property shall obtain and maintain at their own cost and expense property and personal insurance coverage in appropriate and adequate amounts as warranted by their activities on the property.

E. Gould and ML hereby agree to indemnify and hold Schnitzer and Liquid Air harmless from any loss, cost, damage or injury, of any kind whatsoever, resulting directly or indirectly from any entry onto the Property by USEPA, Gould, ML, their contractors, subcontractors, agents and representatives or from sampling or monitoring carried out on the Property.

F. It is Schnitzer's position that Gould and ML are liable to Schnitzer for all attorney's and consultant's fees which have been or will be incurred by Schnitzer in connection with the sampling and monitoring to be

conducted on the Property. Gould and WL deny that any such liability exists. The parties agree to reserve their rights regarding such liability, and further agree that nothing in this Agreement shall waive or modify in any way the rights of the parties regarding such liability.

This Agreement shall be effective as of this _____ day of October, 1986.

EXHIBIT 5(4 of 24)

SCHNITZER INVESTMENT CORP.

By: _____
Title: Vice Pres.

LIQUID AIR CORPORATION

By: _____
Title: Secretary

GOULD INC.

By: _____
Title: Asst Gen. Counsel

WL INDUSTRIES, INC.

By: _____
Title: Asst Secretary

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

By: _____
Title: _____

EXHIBIT 6 15 of 24

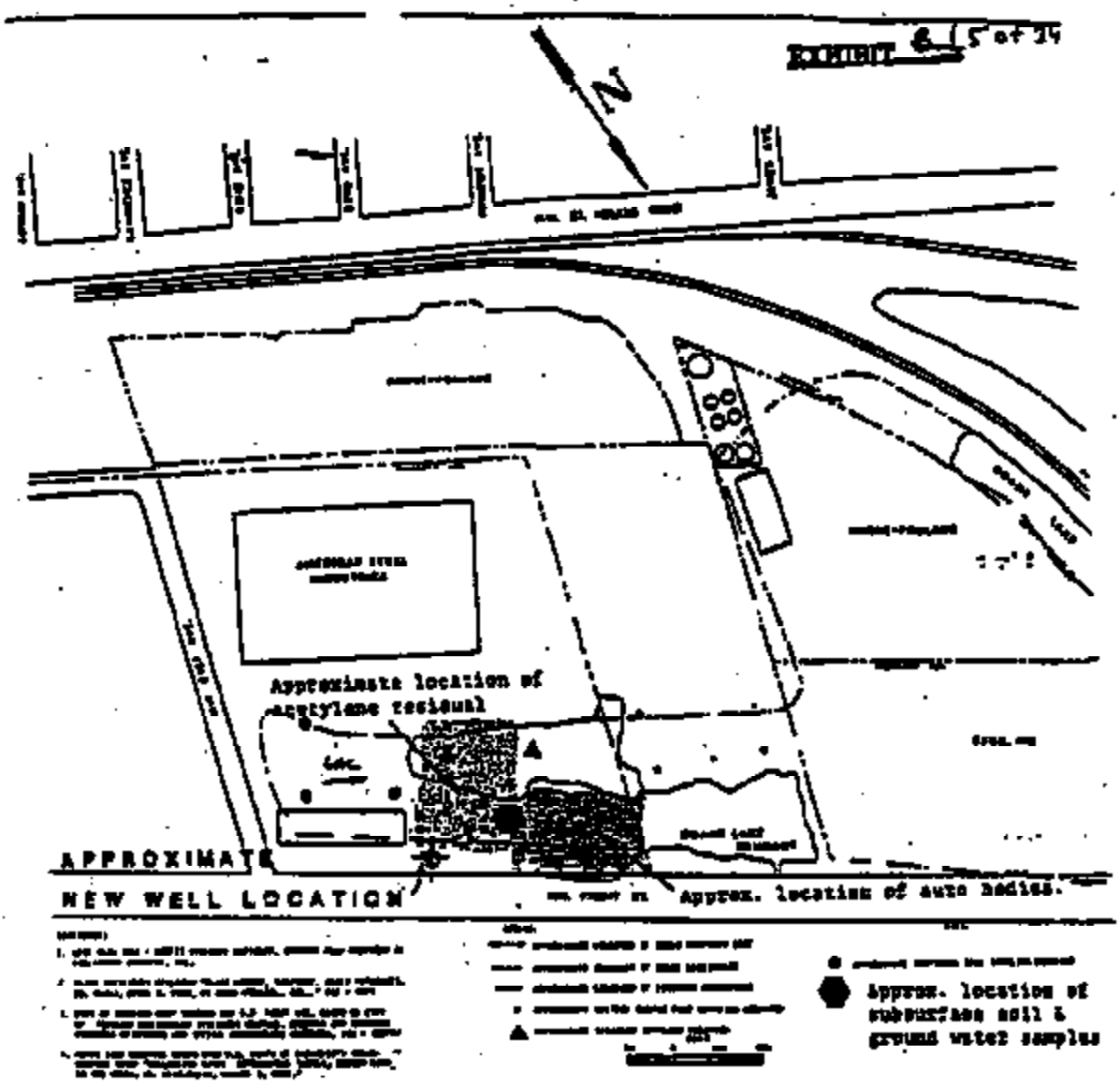

Figure-1

DRAWN BY	CHECKED BY	IMPACT ANALYSIS The Liquid Air Company	APPROVED	Century West Engineering
SURVEY BY	SCALE		DATE	
DRAWN BY	DWG NO			

6 042767

EXHIBIT E (6 of 24)

December 15, 1986

Mark C. Rutzick
PRESTON, THORGRIMSON,
ELLIS & HOLMAN
2000 I.B.M. Building
PO Box 2927
Seattle, Washington 98111

Re: Your Client: Schnitzer Investment Corp.
EPA Subsurface and Ground Water Samples
- Portland, OR

Dear Mr. Rutzick:

Pursuant to your letter of December 5, 1986, enclosed please find Agreement with Respect to Sampling and Monitoring which has been executed by Liquid Air Corporation. After execution by the Environmental Protection Agency, please provide me with a fully executed copy for my files.

Thank you for your assistance in this matter. Should you have any questions, please feel free to contact me.

Yours very truly,

Kathleen A. Brown
Paralegal
General Counsel's Office

KAB:vwe

FILE Portland (W.W. Front)

G 942768

LAW OFFICES OF
PRESTON, THORGRIMSON, ELLIS & HOLMAN
1200 S.W. 5TH AVENUE, SUITE 1800
PORTLAND, OREGON 97204
(503) 228-3200
TELECOPY (503) 248-9085

December 5, 1986

EXHIBIT 6 (7 of 24)

Ms. Cathy Brown
Liquid Air Corporation
Legal Department
2121 N. California Boulevard
Walnut Creek, California 94596

RECEIVED
DEC 11 1986

Dear Ms. Brown:

Enclosed is the Agreement With Respect To Sampling And Monitoring regarding the property leased by Liquid Air Corporation from Schnitzer Investment Corp. in Portland, Oregon which is adjacent to the Gould/NL Superfund site. This agreement has been executed by Gould and NL. Upon execution by Liquid Air Corporation, I will have the agreement executed by Schnitzer Investment Corp. and forwarded to the Environmental Protection Agency.

The agreement as executed by Gould and NL contains references on pages 1 and 3 to "Liquid Air Disposal, Inc." You have informed me that the proper name for your company is "Liquid Air Corporation." I have therefore changed the two references in the agreement to state the correct name of your company.

By copy of this letter, I am informing Gould and NL of these changes to the agreement. There is no substantive change to the agreement in any manner.

Feel free to contact me if you have any questions about the agreement. My understanding from our previous conversation is that Liquid Air Corporation will be able to execute this agreement as presently drafted.

Very truly yours,

Mark C. Rutzick

MCR:cp
cc: Michael C. Veysey
Patricia Cirone-Storm, Ph.D.
Janet D. Smith

FILE Lai lease

G 042769

LAW OFFICES OF
PRESTON, THORGRIMSON, ELLIS & HOLMAN

RECEIVED NOV 24

November 17, 1986

EXHIBIT 8 (8 of 24)

Mr. Michael C. Veysey
Assistant General Counsel
Gould, Inc.
10 Gould Center
Rolling Meadows, Illinois 60008

FILE LAI Legal Portland (FOR

Re: Gould/NL Portland Superfund Site

Dear Mr. Veysey:

On October 31, 1986, engineers from Dames & Moore and Century Environmental Sciences met at the Liquid Air site to stake the location of a well.

I have now revised the Agreement With Respect To Sampling And Monitoring to specify the location of the well as being that which was staked on October 31, 1986, and is described in Figure 1 which is now attached to the Agreement.

You and Janet Smith previously executed the earlier draft of the Agreement. However, since it has been changed, I am forwarding an unexecuted copy of the revised Agreement, and am asking you to sign the Agreement, forward it to Janet Smith for her signature, and return it to me at your earliest convenience.

I have had no response from Liquid Air to my letter of October 14, 1986. I will make another effort to obtain their signature on the Agreement. However, Schnitzer Investment Corp. will not delay its execution of the Agreement if Liquid Air fails to respond.

Very truly yours,

Mark C. Butzick

MCB:cp
Enclosure
cc: Patricia Cirone-Storm, Ph.D.
Bradley M. Marten
John DeLong

G 042770

LAW OFFICES OF
PRESTON, THORGRIMSON, ELLIS & HOLMAN

October 14, 1986

EXHIBIT 8 (9 of 24)

RECEIVED OCT 22 1986

Mr. John DeLong
Liquid Air Disposal, Inc.
3330 N.W. Yeon Avenue
Portland, Oregon 97210

Except for the name, agreement looks O.K. — I suppose we have authority to cooperate if Schnitzer requests

Dear Mr. DeLong:

This firm represents Schnitzer Investment Corp., the lessor of the property you lease at 6501 N.W. Front Avenue in Portland. As you probably know, Schnitzer has recently been involved in negotiations with Gould, Inc., and NL Industries, Inc., regarding a request by Gould and NL to enter upon the property at 6501 N.W. Front Avenue for the purpose of conducting environmental sampling and monitoring activities in connection with the planned clean-up of the adjacent Gould property, which has been designated as a Superfund site by the Environmental Protection Agency.

After lengthy negotiations, Schnitzer has tentatively agreed with Gould and NL Industries regarding the terms of an agreement with respect to sampling and monitoring. Schnitzer believes that Liquid Air Disposal, Inc., should be a signatory to this agreement since the agreement involves entry upon the land your company occupies, and could involve some disruption to your activities.

Accordingly, I am enclosing a copy of the tentative Agreement With Respect To Sampling And Monitoring for review by Liquid Air. For background information, I am also enclosing some correspondence between Schnitzer and Gould/NL relating to the negotiation for this agreement.

The Environmental Protection Agency wants the agreement signed as soon as possible so that the clean-up at the Gould site can begin. Therefore, we would be grateful if you could use your best efforts to expedite review of this agreement by your company, and to advise me as soon as possible if your company will sign the agreement as presently drafted. If your company believes that any changes

G 042771

EXHIBIT 6 (10 of 24)

are required in the agreement, please advise me at your earliest convenience.

Those who review this agreement on behalf of your company should feel free to contact me at any time to obtain further information about the agreement.

Very truly yours,

Mark C. Rutzick

MCR:cp
cc: Patricia Cirone-Storm, Ph.D.
Roger Neu
Bradley M. Marten
Michael C. Veysey

LAW OFFICES OF
PRESTON, THORGRIMSON, ELLIS & HOLMAN
Seattle, Washington

October 10, 1986

HAND DELIVERED

EXHIBIT B(11 of 24)

Patricia Cirone-Storm, Ph.D.
Barbara Lither, Esq.
Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, WA 98101

Re: Gould/NL Superfund Site

Dear Dr. Storm and Ms. Lither:

Schnitzer Investment Company, Gould and NL Industries have reached agreement on access to Schnitzer's property. Under the agreement, Schnitzer will reserve its rights against Gould and NL to pursue reimbursement for consulting costs and attorney's fees.

PRESTON, THORGRIMSON,
ELLIS & HOLMAN

By [signature]
Bradley M. Marten

BMM:sm
cc: Michael Veysey
Janet Smith
Mark Rutzick
Roger Neu
10LAMM/08

RECEIVED

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LAW OFFICES OF
PRESTON, THORGRIMSON, ELLIS & HOLMAN

October 10, 1986

EXHIBIT 6 (12 of 34)

Mr. Michael C. Veysey
Assistant General Counsel
Gould, Inc.
10 Gould Center
Rolling Meadows, Illinois 60008

Re: Gould/NL Portland Superfund Site

Dear Mr. Veysey:

Enclosed is a new draft of the proposed access agreement which reflects our agreement of this morning to deal with the issue of reimbursement for attorney's and consultant's fees through a reservation of rights by the parties.

Please advise me as soon as possible whether Gould and NL will execute this agreement as drafted.

I also plan to provide a copy of this agreement, along with background correspondence, to Liquid Air Disposal, Inc., in order to obtain its signature on the agreement.

Very truly yours,

Mark C. Rutzick

MCR:cp
cc: Patricia Cirone-Storm, Ph.D.
Roger Wen
Bradley M. Marten

G 042774

PRESTON, THORGRIMSON, ELLIS & HOLMAN

October 3, 1986

EXHIBIT 6 (13 of 24)

HAND DELIVERED

Patricia Cirone-Storm, Ph.D.
Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, WA 98101

Re: Gould/NL Superfund Site, Portland, Oregon

Dear Ms. Storm:

I am writing to report to you on the status of the negotiations between Schnitzer, Gould and NL concerning site access to the Schnitzer property adjacent to the Gould/NL Superfund site. Schnitzer is doing everything possible to provide EPA with the access it seeks while still protecting its property rights. We have reached agreement on the location of the sampling, after a successful meeting between Dames & Moore and Century West, Schnitzer's consultant. We are also attempting to expedite an agreement with Gould and NL. As you know, Schnitzer wrote to Gould on September 23, 1986, with proposed revisions to Gould's access agreement. Gould took a week to respond to this letter, and only responded after both EPA and Schnitzer called Gould directly. On the day Schnitzer received Gould's response (September 30, 1986), Schnitzer sent an immediate response to Gould's letter. As you will see from this exchange of correspondence (copies attached), Schnitzer and Gould have agreed on virtually all terms, with the exception of payment of the consulting and attorney's fees Schnitzer has incurred as a consequence of Gould's discharge of contaminants. Notwithstanding the contrary position that Gould (and to some extent, EPA) has taken, there is clear Ninth Circuit authority which entitles Schnitzer to recover these costs. See, Wickland Oil Terminals v. Asarco, Inc., 792 F.2d 887, 892 (9th Cir. 1986). We expect that Gould is reanalyzing its position in light of the Wickland Oil case and will respond favorably to our request for reimbursement.

Schnitzer has not received a response from Gould to its September 30, 1986 letter, despite repeated phone calls, including one this morning. Gould has indicated, however, that it would like to consult with NL Industries as to its position

10/03/1986 16:33 PTON THORGRIMSON SEA. 206 [illegible] P.01

Patricia Cirone-Storm, Ph.D.
Page 2
October 3, 1986

EXHIBIT 6 (14 of 24)

and that it will respond to Schnitzer early next week. A copy of Schnitzer's letter to Gould confirming this arrangement is enclosed.

Schnitzer is mindful of EPA's need to obtain access to the property as soon as possible. We believe we are far enough along in our negotiations with Gould that an agreement on access can be reached without EPA intervention and that any such intervention would delay EPA's access to the property. We will keep you advised of the progress of our discussions with Gould, and I will call you next week to report on our status.

PRESTON, THORGRIMSON,
ELLIS & HOLMAN

By Brad Marten
Bradley M. Marten

BMM:am
Enclosures
cc: Barbara Lither, Esq.
Roger Neu
1023MM/03

6 042776

LAW OFFICES OF
PRESTON, THORGRIMSON, ELLIS & HOLMAN

October 3, 1986

EXHIBIT R (15 of 24)

Mrs. Clarel A. Krpan
Assistant to Michael C. Veysey
Assistant General Counsel
Gould Electronics
10 Gould Center
Rolling Meadows, Illinois 60008

Re: Gould/NL Portland Superfund Site

Dear Mrs. Krpan:

To confirm our telephone conversation of this morning, you advised me that Gould would like to consult with NL Industries prior to responding to my letter to you of September 30, 1986. You indicated that we would be hearing from Gould and NL sometime early next week.

Schnitzer Investment Corp. remains eager to resolve this matter and to reach agreement with Gould and NL Industries as soon as possible.

I have taken the liberty of sending a copy of this letter to the Environmental Protection Agency in Seattle so that they remain aware of the current state of our discussions.

Very truly yours,

Mark C. Rutzick

MCR:cp
cc: Patricia Cirone-Storm, Ph.D.
Ms. Barbara Lither

6 042777

PRESTON, THORGRIMSON, ELLIS & HOLMAN

September 30, 1986

EXHIBIT 6 (16 of 24)

Mrs. Clarel A. Krpan
Assistant to Michael C. Veysey
Assistant General Counsel
Gould Electronics
10 Gould Center
Rolling Meadows, Illinois 60008

Re: Gould/NL Portland Superfund Site

Dear Mrs. Krpan:

Thank you for your letter of September 30, 1986, which responded to my letter to you of September 23, 1986.

With regard to your comments, I will respond in the order of the points you raised.

1. I do not believe that one individual can be authorized to coordinate on behalf of both Schnitzer and Liquid Air. Schnitzer does not feel it is appropriate to permit an individual from Liquid Air to act on behalf of Schnitzer, and Schnitzer is unwilling to accept the risk and possible exposure of acting on behalf of Liquid Air. Therefore, each company must be consulted separately. In practice, I am sure that this can be done very conveniently.

2. We will accept insurance in "appropriate and adequate amounts."

3. Your interpretation of 42 U.S.C. § 9607(2),(4)(B) is incorrect. The United States Court of Appeals for the Ninth Circuit has recently held that the costs incurred by a private party in investigating and testing for the presence of hazardous substances is recoverable under 42 U.S.C. § 9607(a)(2)(B) even without any government approval. Wickland Oil Terminals v. Asarco, Inc., 792 F.2d 887, 892 (9th Cir. 1986). The Court specifically held that investigatory and testing expenses are recoverable even where the

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EXHIBIT 6 (17 of 124)

party incurring these expenses has not incurred any actual, on-site clean-up costs. This is precisely the situation in which Schnitzer finds itself today. The Wickland Oil Terminals case is direct, controlling authority in support of Schnitzer's position that Gould and NL Industries are liable to Schnitzer for the costs it has incurred in connection with the clean-up of the contaminated Gould/NL site.

4. The fact that Gould and NL may have incurred additional expenses for contractors is entirely the fault of Gould and NL. We have no idea why Gould and NL hired contractors and brought them to the site of the Schnitzer property without first obtaining Schnitzer's agreement to allow the contractors to enter upon the property. It would have been more appropriate to obtain Schnitzer's consent before bringing the contractors to the site.

Schnitzer Investment Corp. hopes to be able to execute an agreement with Gould and NL Industries in the very near future so that this matter may proceed expeditiously to achieve the necessary clean-up of the Gould/NL site. Frankly, we feel it is quite regrettable that Gould has chosen to attempt to portray Schnitzer as the "bad guy" with the Environmental Protection Agency when Schnitzer's only interest from the beginning was to understand what was being asked of it and to make an informed evaluation of a very complex situation with which Schnitzer has had no previous familiarity.

I look forward to hearing from you as soon as possible so that agreement may be reached by the end of this week if at all possible.

Very truly yours,

Mark C. Rutzick

MCR:cp
Enclosures
cc: Patricia Cirone-Storm, Ph.D.
Ms. Barbara Luther

G 042779

[illegible]
[illegible] 312 [illegible]

EXHIBIT 8(18 of 24)

GOULD
Electroni

EXHIBIT

September 30, 1986

Mark C. Rutzick, Esq.
Preston, Thorgrimson, Ellis & Holman
1230 S.W. 1st Avenue, Suite 300
Portland, Oregon 97204

Re: Gould/NL Portland Superfund Site

Dear Mr. Rutzick:

I am in receipt of your revised version of the Agreement with Respect to Sampling and Monitoring which accompanied your letter of September 29, 1986. Your addition of Liquid Air Disposal, Inc. as a signatory seems appropriate. However, is it necessary that all activities be coordinated with representatives of both Schnitzer and Liquid Air? In the interest of efficiency, could one individual be authorized to coordinate on behalf of both?

Regarding paragraph D of your proposed Agreement we wish to substitute the words "appropriate and adequate amounts" for your wording of "the amount of $5 million or such higher appropriate amount".

Concerning paragraph E of your proposed Agreement, NL agrees to indemnify along with Gould. We do not, however, consider the attorney's fees and/or consultant's fees incurred by Schnitzer Investment Corp. as being "necessary costs" under 42 U.S.C. 9607(4)(B). These sums were expended voluntarily and not as a necessary response to this situation. They were done for Schnitzer's and/or Liquid Air's own information and use.

As a matter of fact, Gould and NL will incur additional expense due to the length of time we have spent attempting to gain access to Schnitzer's property. My first conversation with Fred Rusina regarding this issue was on July 11, 1986, and because of the fact that we have not been able to gain access to the property as yet, our contractors had to remove their equipment from the vicinity. It will be necessary for them to bring drilling equipment, etc., back to perform the necessary procedures on this property.

G 042780

EXHIBIT G (19 of 24)

We are very anxious to resolve this and accomplish the activities we are bound to perform under the Consent Order entered into with the USEPA. Please let us know as soon as possible if you accept the changes in the Agreement which are suggested above.

Sincerely,

Claral A. Krpan

(Mrs.) Claral A. Krpan
Assistant to Michael C. Veysey
Assistant General Counsel

cc: Mark Anderson (Danes & Moore)
Fred R. Bauer (HL)
Janet D. Smith (HL)
Patricia C. Storm (USEPA)
Barbara J. Lircher (USEPA)

G 042781

LAW OFFICES OF
PRESTON, THORGRIMSON, ELLIS & HOLMAN

September 23, 1986

Mrs. Clarel A. Krpan
Assistant to Michael C. Veysey
Assistant General Counsel
Gould Electronics
10 Gould Center
Rolling Meadows, Illinois 60008

Re: Gould/NL Portland Superfund Site

Dear Mrs. Krpan:

Enclosed is a revised version of the Agreement With Respect To Sampling And Monitoring for the property owned by Schnitzer Investment Corp. which is next to the contaminated property owned by Gould, Inc. at 5903 N.W. 61st Avenue, Portland, Oregon. The agreement in the form enclosed is acceptable to Schnitzer Investment Corp.

The agreement has been revised from the draft you previously provided to Fred Rusina. First, this agreement includes Liquid Air Disposal, Inc., as a signatory to the agreement. As the lessee of the Schnitzer Investment Corp. property, Liquid Air should be included in the agreement. Second, the indemnity provision (paragraph 5) has been slightly revised. Third the agreement is modified to reflect that Gould, Inc., and NL Industries, Inc., will indemnify Schnitzer Investment Corp. for its attorney's and consultant's fees which have been or will be incurred in connection with the proposed sampling and monitoring program on the Schnitzer Investment Corp. property.

Payment of these attorney's and consultant's fees is a liability of Gould and NL under 42 U.S.C. § 9607(4)(B), which imposes on the responsible party at a Superfund site "any other necessary costs of response incurred by any other person consistent with the national contingency plan." The attorney's and consultant's fees incurred by Schnitzer Investment Corp. in this instance are "necessary costs of response" by Schnitzer Investment Corp. to the release of

G 042782

EXHIBIT 6 (21 of 24)

hazardous substances on the Gould/ML Superfund site. The term "response" under 42 U.S.C. § 9601(25) includes removal, and the term "removal" under 42 U.S.C. § 9601(23) includes "such actions as may be necessary to monitor, assess, and evaluate the release or threat of release of hazardous substances." The attorney's and consultant's fees incurred by Schnitzer Investment Corp. are necessary for it to "monitor, assess, and evaluate" the actual release of hazardous substances by Gould at the Gould/ML site.

We would be happy to itemize for you the attorney's and consultant's fees incurred to date. We would like these fees paid at the time the enclosed agreement is executed. We will bill you periodically thereafter for such additional fees as may be subsequently incurred.

Schnitzer Investment Corp. intends to cooperate fully with the Environmental Protection Agency and with Dames & Moore to facilitate the clean-up of your contaminated property. Schnitzer Investment Corp.'s consultant, Century Environmental Sciences, is proceeding to work closely with Dames & Moore on the technical and operational aspects of the sampling and monitoring program on the Schnitzer property. We are hopeful that Gould, Inc., will also be cooperative so that the necessary sampling and monitoring can proceed at once with full adherance to the conditions and liabilities imposed by law.

Very truly yours,

Mark C. Rutzick

MCR:cp
Enclosure
cc: Patricia Cirone-Storm, Ph.D.
Century Environmental Sciences
Ms. Barbara Lithar
Roger Wen, Vice-President
Schnitzer Investment Corp.

G 042783

File
LAI lease
6501 NW Front
Portland

EXHIBIT G (22 of 24)

November 11, 1985

CERTIFIED MAIL/RETURN
RECEIPT REQUESTED

Gould Electronics
Two Gould Center
Rolling Meadows, Illinois 60008

Attn: Michael C. Veysey
Business Section - Legal Counsel

Dear Mr. Veysey:

Thank you for your letter of October 4, 1985. Please be advised that Liquid Air Corporation currently operates two facilities in the Portland area; Office & Plant at 3300 N.E. Yeon and an Acetylene Plant at 6501 N.W. Front. Both of these properties are not owned by Liquid Air; they are leased from Schnitzer Investment Corporation. Therefore, Liquid Air Corporation cannot comply with your request to commit to soil, water and air sampling.

By copy of this letter to Linda Wakefield, Property Manager for Investment Corporation, I am attaching a copy of your October 4 letter for Schnitzer's review and response.

Should you have any questions, please contact Ms. Wakefield directly at (503) 224-9900.

Very truly yours,

Kathleen A. Brown
General Counsel

kab/jl
encls.

cc: Linda Wakefield
Schnitzer Investment Corporation
3200 N. W. Yeon Avenue
P. O. Box 10047
Portland, OR 97210

6 042764

Gould Inc.
10 Gould Center, Rolling M...
Telephone (312) 640-4000

GOULD
Electronics

October 4, 1985

CERTIFIED MAIL/RETURN RECEIPT REQUESTED

EXHIBIT 6 (21 of 24)

Plant Manager
Liquid Air Corporation
1330 N.W. Yeon Avenue
Portland, Oregon 97210

Dear Sir:

Gould Inc. and NL Industries, Inc. are performing a remedial investigation and feasibility study at the Gould site located at 5900 N.W. 61st Avenue, Portland, Oregon. The remedial investigation and feasibility study may include, in general terms, groundwater, soil and air sampling on the Gould site and its environs. These activities are being conducted pursuant to the Administrative Order on Consent entered into by the U.S. Environmental Protection Agency (EPA), Gould Inc. and NL Industries, Inc.

The area in the vicinity of the site where investigatory activities may occur includes your property. The nature of the anticipated investigations may include the following types of activities: (1) the placement and use of air monitoring instruments; (2) the collection of soil samples and/or soil borings; and (3) the monitoring of groundwater by sampling existing wells or installing new wells to be sampled.

Gould and NL hereby request permission for their authorized employees and/or contractors and EPA to enter your company's property to conduct necessary samplings and monitoring. Notice will be given to you in advance of the initial sampling.

After you have reviewed the enclosed consent form, please have the appropriate person execute the document and return it to us at your earliest convenience.

Thank you for your assistance and attention to this request. Please contact me at (312) 640-4716 if you require further information.

Sincerely,

Michael C. Veysey
Business Section Legal Counsel

MCV/cak

Enclosure

G 042785

EXHIBIT 6 (24 of 24)

CONSENT TO SAMPLING AND MONITORING

Liquid Air Corporation, by and through its duly authorized representative, does hereby grant to United States Environmental Protection Agency and/or its authorized representatives and Gould Inc. and NL Industries, Inc. and their contractors and subcontractors retained directly or indirectly, permission to conduct sampling and monitoring activities at .

This sampling program is being done pursuant to the Administrative Order on Consent entered into by the United States Environmental Protection Agency, Gould Inc. and NL Industries, Inc.

LIQUID AIR CORPORATION

By:_____

Title:_____

SUBSCRIBED AND SWORN to before me this_____day of_____, 1985.

_____
Notary Public

COPPER & BRASS SALES -- C23000 RED BRASS
MATERIAL SAFETY DATA SHEET
NSN: 343900F049811
Manufacturer's CAGE: 93932
Part No. Indicator: A
Part Number/Trade Name: C23000 RED BRASS

General Information

Item Name: COPPER/COPPER ALLOYS
Company's Name: COPPER AND BRASS SALES INC
Company's Street: 17401 TEN MILE RD
Company's City: EASTPOINTE
Company's State: MI
Company's Country: US
Company's Zip Code: 48021-1256
Company's Emerg Ph #: 215-586-1800/810-775-7710
Company's Info Ph #: 215-586-1800/810-775-7710
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 01FEB96
Safety Data Review Date: 27AUG96
Preparer's Company: COPPER AND BRASS SALES INC
Preparer's St Or P. O. Box: 17401 TEN MILE RD
Preparer's City: EASTPOINTE
Preparer's State: MI
Preparer's Zip Code: 48021-1256
MSDS Serial Number: BZWPM

Ingredients/Identity Information

Proprietary: NO
Ingredient: COPPER (DUST & MIST), BRONZE POWDER *96-2*
Ingredient Sequence Number: 01
Percent: 85
NIOSH (RTECS) Number: GL5325000
CAS Number: 7440-50-8
OSHA PEL: 0.1 MG(CU)/M3 (FUME)
ACGIH TLV: 0.2 MG/M3 (FUME)
Other Recommended Limit: 1 MG(CU)/M3 (DUST)

Proprietary: NO
Ingredient: ZINC OXIDE *96-2*
Ingredient Sequence Number: 02
Percent: 15
NIOSH (RTECS) Number: ZH4810000
CAS Number: 1314-13-2
OSHA PEL: 5 MG/CUM
ACGIH TLV: 5 MG/CUM FUME

Physical/Chemical Characteristics

Appearance And Odor: SILVER/YELLOW TO RED COLOR SOLID W/NO ODOR.
Melting Point: 1290-2260F
Specific Gravity: 7.45-9
Solubility In Water: INSOLUBLE

Fire and Explosion Hazard Data

Extinguishing Media: USE SPECIAL MIXTURES OF DRY CHEMICAL/SAND.
Special Fire Fighting Proc: WEAR NIOSH/MSHA SCBA & PROTECTIVE CLOTHING.
Unusual Fire And Expl Hazrds: SOLID MASSIVE FORM ISN'T COMBUSTIBLE. MOLTEN METAL MAY REACT VIOLENTLY W/WATER.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): WATER, HEAT, FLAMES, CHEMICAL REACTIONS.
Materials To Avoid: OXIDIZERS, ACIDS, BASES
Hazardous Decomp Products: METAL FUME.
Hazardous Poly Occur: NO

Health Hazard Data

Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: COPPER-INHALATION: FUMES MAY CAUSE METAL FUME FEVER. SKIN: DERMATITIS, KERATINIZATION OF THE HANDS & THE SOLES OF THE FEET. COPPER DUST & FUME CAUSES IRRITATION OF THE UPPER RESPIRATORY TRACT.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: COPPER-FLU-LIKE SYMPTOMS, SKIN & HAIR DISCOLORATION, METALLIC TASTE IN THE MOUTH, NAUSEA.
Emergency/First Aid Proc: EYES: FLUSH W/RUNNING WATER. SKIN: VACUUM OFF EXCESS DUST. WASH W/SOAP & WATER. INHALATION: REMOVE TO FRESH AIR. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: LARGE: REMOVE BY VACUUMING/WET SWEEPING TO PREVENT HEAVY CONCENTRATION OF AIRBORNE DUST. IF LIQUIDS CONTAINING SOLUBILIZED METAL ARE SPILLED EVACUATE AREA. ABSORB BY MEANS OF VERMICULITE, DRY SAND/SIMILAR MATERIAL. (SEE SUPP)
Waste Disposal Method: DISPOSE OF IAW/FEDERAL, STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: STORE AWAY FROM INCOMPATIBLE MATERIALS & KEEP DUST FROM IGNITION SOURCES.

Control Measures

Respiratory Protection: IF EXPOSURE ABOVE THE PEL/TLV, WEAR NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation: LOCAL EXHAUST VENTILATION.
Protective Gloves: REQUIRED
Eye Protection: SAFETY GLASSES W/SIDE SHIELDS
Other Protective Equipment: FACE SHIELDS, SPECIALLY TINTED GLASS.
Suppl. Safety & Health Data: SPILLS CONT'D: CLEANUP PERSONNEL SHOULD WEAR RESPIRATORS & PROTECTIVE CLOTHING. VENTILATE AREA.

Transportation Data

Disposal Data

Label Data

Label Required: YES
Label Status: G
Common Name: C23000 RED BRASS
Special Hazard Precautions: COPPER-INHALATION: FUMES MAY CAUSE METAL FUME FEVER. SKIN: DERMATITIS, KERATINIZATION OF THE HANDS & THE SOLES OF THE FEET. COPPER DUST & FUME CAUSES IRRITATION OF THE UPPER RESPIRATORY TRACT. COPPER-FLU-LIKE SYMPTOMS, SKIN & HAIR DISCOLORATION, METALLIC TASTE IN THE MOUTH, NAUSEA.
Label Name: COPPER AND BRASS SALES INC
Label Street: 17401 TEN MILE RD
Label City: EASTPOINTE
Label State: MI
Label Zip Code: 48021-1256
Label Country: US
Label Emergency Number: 215-586-1800/810-775-7710

MARMON/KEYSTONE CORPORATION

THE PIPE AND TUBING PEOPLE

P.O. BOX 992, Butler, PA 16001
EMERGENCY PHONE NUMBER (412) 283-3000

ISSUE DATE:
JANUARY 1, 1998

MATERIAL SAFETY DATA SHEET

TRADE NAME (Common Name or Synonym)
Aluminum Alloy

CHEMICAL NAME
Alloy Series 1000, 2000, 3000, 5000, 6000 and 7000

I. INGREDIENTS

Material or Component	CAS Number	% Weight	EXPOSURE LIMITS OSHA PEL (mg/m³)	EXPOSURE LIMITS ACGIH TLV (mg/m³)
Base Metal				
Aluminum (Al)	7429-90-5	90-99.7	15 Dust	10.0 Metal Dust & Oxide 5.0 Welded Fume
Alloying Elements				
Chromium (Cr)	7440-47-3	<0.01-0.4	1.0 Chrome Metal	0.5 Chrome Metal
Copper (Cu)	7440-50-8	<0.05-6.0	0.1 Fume/1.0 Dust	0.2 Fume/1.0 Dust
Iron (Fe)	1309-37-1	<0.35-1.0	10 Oxide Fume	5 Oxide Fume
Magnesium (Mg)	1309-48-4	<0.03-4.9	15 Oxide Fume	10 Oxide Fume
Manganese (Mn)	7439-96-5	<0.02-1.5	5c Dust/5c Fume	5c Dust/1 Fume
Silicon (Si)	7440-21-3	<0.25-1.8	15 Dust	10 Total Dust
Zinc (Zn)	1314-13-2	<0.05-6.1	5 Oxide Fume	10 Dust/5 Fume
Lead (Pb)	7439-92-1	<0.40-0.7	.05 Dust & Fume	0.15 Dust & Fume

Note: Aluminum alloys will be comprised of various combinations of the elements shown above. In addition, other alloying elements may be present in minute quantities. No permissible exposure limits (PEL) or threshold limit values (TLV) exist for aluminum alloys. Values shown are applicable to component elements.

II. PHYSICAL DATA

MATERIAL IS (At Normal Conditions)	APPEARANCE AND ODOR	% VOLATILE BY VOLUME	VAPOR DENSITY
☐ LIQUID ■ SOLID ☐ GAS ☐ OTHER	Silvery-Gray, Odorless	N/A	N/A

ACIDITY/ALKALINITY			
pH = N/A	Melting Point 900-1200 °F Boiling Point N/A °F	Specific Gravity (H_2O = 1) Approx. 2.5-2.9 Solubility in water (% by weight) Negligible	VAPOR PRESSURE (mm Hg at 20° C) N/A

III. PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION: [illegible] fume respirator should be [illegible] particulates. If exposure [illegible] use NIOSH Approved equipment.	HANDS, ARMS AND BODY Protective gloves should be worn as required for welding, burning or handling operations.
EYE AND FACE PROTECTION: Safety glasses should be worn when grinding or cutting. [illegible] welding or cutting.	OTHER CLOTHING AND EQUIPMENT As required depending on operations and safety codes.

IV. EMERGENCY MEDICAL PROCEDURES

INHALATION:	Remove to fresh air; if condition continues, consult a physician.
EYE CONTACT:	Flush thoroughly with running water to remove particulate; obtain medical attention.
SKIN CONTACT:	Remove particles by washing thoroughly with soap and water. Seek medical attention if condition persists.
INGESTION:	If significant amounts of metal are ingested, consult physician.

V. HEALTH/SAFETY INFORMATION

Health

For standard operations (e.g. melting, cutting, grinding), aluminum alloys present a low health risk by inhalation and are usually considered a nuisance dust. Toxicity by ingestion-none expected. Skin and eyes-not an irritant. Welding and plasma cutting of alloys high in copper (2000 and 7000 series) may present the potential for overexposure to copper fumes which can result in upper respiratory tract irritation, nausea, and metal fume fever. Nickel and chromium are other alloying elements considered hazardous as fume; however, they do not present a carcinogenic or other health concern due to their low concentrations of the chemical form in which they are present. Overexposure to lead fumes over an extended period of time can result in such toxic effects as central nervous system disturbances, renal changes, peripheral neuropathy, gastrointestinal disturbances, anemia, and chromosomal changes. The welding of aluminum alloys may generate carbon monoxide, carbon dioxide, ozone nitrogen oxides, infrared radiation and ultraviolet radiation.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Individuals with chronic respiratory disorders (i.e.: asthma, chronic bronchitis, emphysema, etc.) may be adversely affected by any fume or airborne particulate matter exposure.

OCCUPATIONAL EXPOSURE LIMITS: See Products Ingredients Section I.

Fire and Explosion

FLASH POINT	AUTO IGNITION TEMPERATURE	FLAMMABLE LIMITS IN AIR	EXTINGUISHING MEDIA
N/A °F	N/A	Lower N/A % Upper N/A %	For molten aluminum use dry powder or sand.

FIRE AND EXPLOSION HAZARDS
Aluminum tubular products do not present fire or explosion hazards under normal conditions.

EXTINGUISHING MEDIA NOT TO BE USED
Do not use water or halogen agents on molten aluminum.

Reactivity

STABILITY
■ Stable □ Unstable

INCOMPATIBILITY (MATERIALS TO AVOID)
Reacts with strong acids to form hydrogen gas.

CONDITIONS TO AVOID: Aluminum products under normal conditions are stable during use, storage and transportation. Halogen acids and sodium hydroxide in contact with aluminum may generate explosive mixtures of hydrogen. Finely divided aluminum, such as small chips and fines, will form explosive mixtures in air. It also will form explosive mixtures in air in the presence of bromates, iodates, or ammonium nitrate. Strong oxidizers cause violent reactions with considerable heat generation.

VI. ENVIRONMENTAL

SPILL OR LEAK PROCEDURES
Fine turnings and small chips should be swept or vacuumed. Scrap metal can be reclaimed for re-use.

WASTE DISPOSAL METHOD*
Used or unused product should be disposed of in accordance with Federal, State or Local Laws and Regulations.
*Disposer must comply with Federal, State and Local disposal or discharge laws.

VII. ADDITIONAL INFORMATION

Do not touch cast aluminum metal or heated aluminum product with [illegible]
Aluminum experiences no color change during heating. Burns could result.
Some 2000 and 7000 alloys should be stress relieved prior to [illegible]
Aluminum powder must be packaged and shipped as a flammable solid.
Minimize and control operations producing dust and fume.

DISCLAIMER

The information in this MSDS was obtained from sources which we believe are reliable, however, the information is provided without any representation or warranty, express or implied, regarding the accuracy or correctness.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

Material Safety Data Sheet

Material Name: Brass Scrap **ID: NFE-0107**

*** Section 1 - Chemical Product and Company Identification ***

Chemical Name: Mixture
Product Use: Scrap metal usage.
Manufacturer Information

Newell Recycling of Atlanta	404-766-1621
1359 Central Avenue	Joe Carrico
East Point, GA 30344	404-766-1621

*** Section 2 - Composition / Information on Ingredients ***

CAS #	Component	Percent
7440-66-6	Zinc	≤51
7440-50-8	Copper	≥49
7439-96-5	Manganese	≤13
7439-92-1	Lead	≤8
7429-90-5	Aluminum	≤8
7440-31-5	Tin	≤7
7440-21-3	Silicon	≤6
7440-02-0	Nickel	≤4
7439-89-6	Iron	≤4
7440-38-2	Arsenic	≤1
7440-36-0	Antimony	≤1
7440-22-4	Silver	≤1

Component Information/Information on Non-Hazardous Components

This data sheet is prepared as a guideline for typical uses of scrap materials. The user should be aware that the composition of the scrap can vary based upon the raw materials, processes used, and protective coatings that may have been applied to the original materials. The list of ingredients below are typical ingredients thought to be present in the scrap material. This list includes contaminants that may or may not be present. The percentages given vary from shipment to shipment and may not be entirely accurate for a given shipment and may not be entirely accurate for a given shipment.

Protective coatings, including paints, lubricants, corrosion inhibitors, etc., may have been applied to the material before it came under the control of the recycler. These coatings may contain hazardous materials. Typical hazardous materials contained in these coatings include: lead, zinc, chromium, and cadmium. Some organic materials may also be present. The supplier (recycler) may have no specific knowledge of the particular contaminant. However, it is anticipated that the hazardous materials present in the coatings would generally represent less than 0.1% of the total material present. The health hazards presented by these contaminants would produce their greatest potential for exposure during processes such as melting, cutting, welding. These processes could generate metal fumes that might produce the health hazards identified in section III of this MSDS.

It is suggested that the user protect employees by utilizing engineering controls that reduce exposures to acceptable concentrations. Where engineering controls are not feasible, appropriate personal protective equipment should be utilized.

*** Section 3 - Hazards Identification ***

Emergency Overview

Product is supplied as scrap metal consisting of zinc alloy. This is a non-combustible, non-reactive solid material. Processing of the product for some final uses can include formation of dusts, particulates or fumes which may present certain health

hazards. Generation of large quantities of airborne dusts and particulates may produce a fire hazard. Molten metal may react violently with water. Exposure to powder or dusts may be irritating to eyes, nose and throat. Product may cause mechanical abrasions and irritation to the eyes and skin.

Hazard Statements

CAUTION Dusts, particulates or fumes generated from this product may be irritating to the eyes, skin and respiratory system and may cause fever, chills and muscular aches. May contain nickel, copper, arsenic and antimony which may cause allergic skin and/or respiratory sensitization reactions. May contain arsenic, lead and nickel which may cause cancer. Chronic overexposure to dusts, particulates and fumes may result in gastrointestinal damage, lung, liver and kidney damage, anemia, cardiac abnormalities, neurological damage and may pose a reproductive hazard.

Potential Health Effects: Eyes

Dust or powder may cause irritation and/or inflammation to the eye tissue. Rubbing may cause abrasion of cornea.

Potential Health Effects: Skin

Prolonged contact with this product may cause allergic skin sensitization reactions. Dust or powder may irritate the skin. This product may produce skin abrasions, lesions, or cuts.

Potential Health Effects: Ingestion

Ingestion of this product is unlikely; however if ingested may cause gastrointestinal disturbances, abdominal pain, fever, vomiting, and diarrhea. Ingestion of large amounts of product may produce more serious toxicities including: gastric ulcers, shock, metabolic acidosis, decreased white blood cell count, neurological damage, cardiovascular shock, anemia, liver damage, renal failure, lethargy and coma.

Potential Health Effects: Inhalation

Product contains components that may cause allergic respiratory sensitization and cancer. Dusts, vapors, and fumes generated during processing may irritate the respiratory system. Overexposure to processing fumes may cause metal fume fever which is an influenza like illness. Symptoms include headache, metallic taste in the mouth, cough, thirst, throat irritation, shortness of breath, fever, sweating and pain in the limbs. Severe acute overexposure or chronic overexposure to dusts or processing fumes may produce more serious toxicities including: siderosis, lung damage, weakness, impairment of sleep and vision, personality changes, blood formation effects, nervous and circulatory system damage, kidney damage, and may pose a reproductive hazard.

HMIS Ratings: Health: 1* Fire: 0 Reactivity: 0 Pers. Prot.: safety glasses with side shields, gloves
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

*** Section 4 - First Aid Measures ***

First Aid: Eyes

In cases of contact, flush eyes immediately with large amounts of water. If irritation persists get medical attention. In case of mechanical abrasions and cuts, seek medical attention immediately.

First Aid: Skin

For skin contact, wash immediately with soap and water. Cuts or abrasions should be treated promptly with thorough cleansing of the affected area.

First Aid: Ingestion

Due to the physical nature of this material, ingestion is unlikely to occur. If ingestion of a large amount does occur, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

First Aid: Inhalation

If inhaled, immediately remove the affected person to fresh air. If the affected person is not breathing, apply artificial respiration. Seek medical attention immediately.

First Aid: Notes to Physician

No additional information available.

*** Section 5 - Fire Fighting Measures ***

Flash Point: Not applicable
Method Used: Not applicable
Upper Flammable Limit (UFL): Not available
Lower Flammable Limit (LFL): Not available
Auto Ignition: Not applicable
Flammability Classification: Non-flammable
Rate of Burning: Not applicable

General Fire Hazards

Dust accumulation from this product may present an explosion hazard in the presence of an ignition source. Coatings and oils applied to the product may enhance flammability.

Hazardous Combustion Products

This product may release metal oxide fumes by thermal decomposition.

Extinguishing Media

Dry chemical, soda ash, sand.

Fire Fighting Equipment/Instructions

Fire fighters should wear full-face, self contained breathing apparatus and impervious protective clothing.

NFPA Ratings: Health: 1 Fire: 0 Reactivity: 0 Other:

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

* * * Section 6 - Accidental Release Measures * * *

Containment Procedures

Containment of this material should not be necessary. If dusts or particulates are generated, eliminate sources of ignition.

Clean-Up Procedures

Small pieces of this product may be collected with a broom and shovel. Collect dust or particulates using a vacuum cleaner with a HEPA filter. Put material in suitable, covered, labeled containers.

Evacuation Procedures

Isolate area. Keep unnecessary personnel away.

Special Procedures

None necessary.

* * * Section 7 - Handling and Storage * * *

Handling Procedures

Do not inhale dusts or vapors produced during thermal processing. Avoid eye and excessive skin contact. Use only with adequate ventilation. As with all chemicals, good industrial hygiene practices should be followed when handling this material. Special care must be taken to avoid buildup of dusts.

Storage Procedures

Keep this material in a cool, well-ventilated place.

* * * Section 8 - Exposure Controls / Personal Protection * * *

Exposure Guidelines

A: General Product Information

Follow all applicable exposure limits. Keep formation of dusts, particulates and fumes to a minimum.

B: Component Exposure Limits

Copper (7440-50-8)

ACGIH: fume: (0.2) mg/m3 TWA; dusts and mists, as Cu: (1) mg/m3 TWA
OSHA: fume, as Cu: 0.1 mg/m3 TWA
NIOSH: as Cu: 1 mg/m3 TWA (dusts and mists); 0.1 mg/m3 TWA (fume)

Manganese (7439-96-5)

ACGIH: as Mn, 0.2 mg/m3 TWA
OSHA: fume, as Mn: 1 mg/m3 TWA
compounds, as Mn: C 5 mg/m3
NIOSH: as Mn: 1 mg/m3 TWA
3 mg/m3 STEL

Lead (7439-92-1)

ACGIH: 0.05 mg/m3 TWA
OSHA: as Pb: 50 ug/m3 TWA PEL; 30 ug/m3 action level; Poison (see 29 CFR 1910.1025)
NIOSH: as Pb: 0.100 mg/m3 TWA; see Appendix C for supplementary exposure limits

Material Safety Data Sheet

Aluminum (7429-90-5)
ACGIH: metal dust, as Al: 10 mg/m3 TWA
OSHA: total dust, as Al: 15 mg/m3 TWA; respirable fraction, as Al: 5 mg/m3 TWA
NIOSH: total: 10 mg/m3 TWA; respirable dust: 5 mg/m3 TWA; pyro powders and welding fumes: 5 mg/m3 TWA; soluble salts and alkyls: 2 mg/m3 TWA

Tin (7440-31-5)
ACGIH: metal: 2 mg/m3 TWA
0.2 mg/m3 STEL
skin - potential for cutaneous absorption
OSHA: inorganic compounds (except oxides), as Sn: 2 mg/m3 TWA; organic compounds, as Sn: 0.1 mg/m3 TWA
organic compounds: Prevent or reduce skin absorption
NIOSH: as Sn: 2 mg/m3 TWA

Silicon (7440-21-3)
ACGIH: 10 mg/m3 TWA (The value is for total dust containing no asbestos and <1% crystalline silica)
OSHA: total dust: 10 mg/m3 TWA; respirable fraction: 5 mg/m3 TWA
NIOSH: total: 10 mg/m3 TWA; respirable dust: 5 mg/m3 TWA

Nickel (7440-02-0)
ACGIH: metal: (1) mg/m3 TWA
OSHA: 1 mg/m3 TWA
NIOSH: as Ni: 0.015 mg/m3 TWA; NIOSH Potential Occupational Carcinogen - see Appendix A

Arsenic (7440-38-2)
ACGIH: elemental, as As: 0.01 mg/m3 TWA
OSHA: organic compounds, as As: 0.5 mg/m3 TWA
NIOSH: NIOSH Potential Occupational Carcinogen - see Appendix A (organic compounds have no established exposure limit)
C 0.002 mg/m3 (15 min)

Silver (7440-22-4)
ACGIH: metal: 0.1 mg/m3 TWA
OSHA: as Ag: 0.01 mg/m3 TWA
NIOSH: as Ag: 0.01 mg/m3 TWA

Antimony (7440-36-0)
ACGIH: as Sb: 0.5 mg/m3 TWA
OSHA: as Sb: 0.5 mg/m3 TWA
NIOSH: 0.5 mg/m3 TWA

Engineering Controls

Ventilation should be sufficient to effectively remove and prevent buildup of any dusts or fumes that may be generated durin handling or thermal processing.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Wear safety glasses with side shields.

Personal Protective Equipment: Skin

Use impervious gloves.

Personal Protective Equipment: Respiratory

When dusts or thermal processing fumes are generated and ventilation is not sufficient to effectively remove them, appropria NIOSH/MSHA approved respiratory protection must be provided.

Personal Protective Equipment: General

Use good industrial hygiene practices in handling this material.

*** Section 9 - Physical & Chemical Properties ***

Material Safety Data Sheet

Material Name: Brass Scrap **ID: NFE-0107**

Appearance:	Depends upon scrap composition, most often appears as a soft reddish colored metal.	**Odor:**	Not available
Physical State:	Solid	**pH:**	Not applicable
Vapor Pressure:	Not applicable	**Vapor Density:**	Not applicable
Boiling Point:	4700 deg F (2600 deg C)	**Melting Point:**	2000 deg F (1100 deg C)
Solubility (H2O):	Insoluble	**Specific Gravity:**	9

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability

Stable under normal conditions.

Chemical Stability: Conditions to Avoid

Avoid dispersion of dust in air. Molten metal may react violently with water. Fine particles, dust or fumes may be flammable or explosive.

Incompatibility

Copper, zinc and manganese may react with acetylene, ammonium nitrate, barium bromate, barium chlorate, barium iodate, bromates, calcium bromate, phosphorus, potassium bromate, potassium chlorate, potassium iodate, potassium peroxide, sodium azide, sodium bromate, sodium chlorate, sodium iodate, sodium peroxide, zinc bromate, zinc chlorate, zinc iodate, acids, barium dioxide, barium nitrate, cadmium, carbon disulfide, chlorates, chlorine, chlorine trifluoride, chromic anhydride, ethyl acetoacetate and tribromoneopentyl alcohol, fluorine, hydrazine, hydrazine mononitrate, hydroxylamine, lead azide, manganese chloride, nitric acid, perfomic acid, sulfur, tellurium, aluminum and air, hydrogen peroxide, nitrogen dioxide, phosphorus, sulfur dioxide.

Hazardous Decomposition

Decomposition of this product may yield metallic oxides.

Hazardous Polymerization

Will not occur.

*** Section 11 - Toxicological Information ***

Acute and Chronic Toxicity

A: General Product Information

No information available for the product. Operations which supply sufficient energy to the product (i.e. welding, high speed grinding or melting) can release dust or fumes which may make components of the product biologically available. Exposure to dusts or fumes from some metals including iron, zinc, manganese and copper can produce a condition known as metal fume fever, a flu-like illness generally lasting 24 hours or less including symptoms of nausea, vomiting, chest tightness, muscle aches and weakness. Aluminum soluble compounds, when ingested or inhaled, may have neurotoxic effects evidently due to the metal binding to nervous tissue. Chronic overexposure to aluminum can result in lung damage and has been associated with asthma-like syndrome. Accumulation of aluminum in the body may result in neurological damage, anemia and bone softening. Repeated overexposure to high levels of aluminum oxide may lead to pulmonary fibrosis, a progressive lung disorder. Early signs of manganese poisoning are sluggishness, loss of appetite, sleepiness, weakness in the legs, uncontrollable laughter, hallucinations, delusions, spastic or slow gait, speech impairment, aggressiveness, tremor, mask-like faces, and clumsy movements. Overexposure to manganese may result in CNS effects, anemia and lung damage. Chronic exposure to copper fume or dust can cause respiratory tract irritation, hemolytic anemia and allergic contact dermatitis. Other possible effects of copper overexposure include discoloration of skin or hair, and liver and kidney damage. Iron dust can irritate the eyes and respiratory tract by mechanical action. Acute iron poisoning may involve hemorrhagic vomiting and diarrhea, abdominal pain, acidosis, coagulopathy, shock, coma and convulsions followed by hepatic and renal failure and perhaps cardiovascular collapse. Chronic inhalation of iron has resulted in mottling of the lungs, a condition referred to as siderosis. This is considered benign pneumoconiosis and does not ordinarily cause significant physiologic impairment. Systemic effects from ingestion of nickel include capillary damage, kidney damage, myocardial weakness and central

nervous system depression. Allergic skin sensitization reactions are the most frequent effect of exposure to nickel compounds. Contact with nickel compounds may also result in allergic lung sensitization reactions. Lead has been found to have toxic effects on both the central and peripheral nervous systems. Acute exposure to lead may cause acute encephalopathy which is accompanied by the symptoms of ataxia, coma, and convulsions. As toxicity progresses, symptoms of peripheral neuropathy can develop, as well as some cases of irreversible kidney damage. Zinc poisoning can cause anemia, lethargy and dizziness. Exposure to antimony has been known to cause allergic skin sensitization reactions resulting in "antimony spots" on the surface of the skin. Chronic overexposure to antimony may cause gastrointestinal damage, cardiac damage, pneumoconiosis, and obstructive lung disease. With acute exposure, arsenic can cause damage to mucous membranes and skin, and is a severe eye and respiratory tract irritant. Arsenic can also cause severe gastrointestinal damage, muscle cramps, cardiac abnormalities, anemia, decreased white blood cell count, and enlargement of the liver. Arsenic compounds may cause allergic skin sensitization. Silver can be harmful if inhaled, absorbed through the skin, or ingested. Symptoms may include gastrointestinal distress, pulmonary edema, convulsions and shock. Chronic overexposure to silver may cause argyria, a gray-blue pigmentation of the skin or organs, loss of strength, convulsive seizures, mild bronchitis, and renal and liver toxicities. Dusts and fumes from this product may cause cancer, reproductive and/or birth defects.

B: Component Analysis - LD50/LC50

Manganese (7439-96-5)
Oral LD50 Rat: 9 gm/kg

Silicon (7440-21-3)
Oral LD50 Rat: 3160 mg/kg

Iron (7439-89-6)
Oral LD50 Rat: 30 gm/kg

Arsenic (7440-38-2)
Oral LD50 Rat: 763 mg/kg
Oral LD50 Mouse: 145 mg/kg

Antimony (7440-36-0)
Oral LD50 Rat: 7 gm/kg

Carcinogenicity

A: General Product Information

No information available for the product. Although some lead salts have produced tumors in animals, the evidence is insufficient to determine the carcinogenicity of lead in humans. Inorganic arsenic can produce lung, skin and lymphatic cancer with long term occupational exposure above the established limits. The carcinogenic effect of nickel has been well documented in occupationally exposed nickel refinery workers. Lung and nasal cancers were the predominant forms of cancer in the exposed workers. There is a possible link between occupational exposure to antimony and lung cancer.

B: Component Carcinogenicity

Lead (7439-92-1)
ACGIH: elemental, as Pb; A3 - animal carcinogen
OSHA: as Pb: 50 ug/m3 TWA PEL; 30 ug/m3 action level; Poison (see 29 CFR 1910.1025)
IARC: Monograph 23, Supplement 7; 1987 (and lead compounds; evaluated as a group) (Group 2B (sufficient animal data))

Nickel (7440-02-0)
NIOSH: occupational carcinogen
NTP: suspect carcinogen (Listed under Nickel and certain nickel compounds') (Possible Select Carcinogen)
IARC: Monograph 49; 1990 (and alloys) (Group 2B (sufficient animal data))

Arsenic (7440-38-2)
ACGIH: elemental, as As: A1-confirmed human carcinogen
NIOSH: occupational carcinogen
NTP: known carcinogen (Listed under 'Arsenic and certain arsenic compounds') (Select Carcinogen)
IARC: [present] This evaluation applies to the group of chemicals as a whole and not necessarily to all individual chemicals within the group. (Group 1 (carcinogenic to humans))

Epidemiology

No information available for the product.

Neurotoxicity

No information available for the product. Inhalation of fine aluminum particles has produced progressive encephalopathy, followed by dementia and convulsions. Chronic overexposure to manganese can cause "manganism". Manganism is characterized by fatigue, irritability, headaches and asthenia. Symptoms are reversible when exposure stops. Symptoms of lead toxicity include behavioral disturbances including irritability, restlessness, insomnia, and other sleep disturbances, fatigue, vertigo, headache, poor memory, tremor, depression, and apathy. In acute lead encephalopathy, neurological damage can be permanent. Neurological changes have been reported after inorganic arsenic inhalation and may include peripheral neuropathy of sensory and motor neurons resulting in numbness, loss of reflex and muscle weakness. Encephalopathy resulting in hallucinations, agitation, emotional changes and memory loss may linger after arsenic exposure.

Mutagenicity

No information available for the product. The binding of DNA to aluminum may alter, expose, or hide different critical regions in genes for expression or regulation in vivo. Nickel inhibited DNA repair and induced transformation in experimental assays. Manganese has caused sister chromatid exchanges in human and hamster cells. Exposure to lead has been reported to cause chromosome aberrations in humans. Exposure to antimony has been reported to induce chromosomal aberrations in bacteria.

Teratogenicity

No information available for the product. Manganese and aluminum have been shown to have teratogenic effects. Manganese, copper and nickel have been reported to have adverse reproductive effects in experimental animals. Copper and nickel have been shown to be fetotoxic in experimental animals. Lead has a wide variety of reproductive effects in humans. It can affect both the male and female reproductive organs as well as egg and sperm production and development. Lead can also cause neurodevelopmental debilitations in children from both prenatal and postnatal exposures. Excessive zinc levels have been reported to be associated with increased risk for neural tube defects. There is evidence that arsenic can have reproductive effects in both humans and animals. There may be an increased risk for miscarriage and birth defects in women exposed to arsenic. Women working in antimony processing had increased miscarriages, premature births, gynecological disease and developmental delay in their children.

Other Toxicological Information

Under normal conditions of handling, the likelihood of inhaling or ingesting amounts necessary for these effects to occur is very small.

*** Section 12 - Ecological Information ***

Ecotoxicity

A: General Product Information

No information available for the product.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Zinc (7440-66-6)

LC50 (96 hr) rainbow trout: 0.24-0.76. Cond: 20-46 mg/L CaCO3.; LC50 (96 hr) fathead minnow: 0.78-0.96 mg/L. Cond: 20 mg/L CaCO3.; LC50 (96 hr) fathead minnow: 4.7-6.1 mg/L. Cond: pH 8.0, 50 mg/L CaCO3.; LC50 (96 hr) bluegill: 5.4-10.6. Cond: 20-46 mg/L CaCO3.; LC50 (96 hr) bluegill: 40.9 mg/L. Cond: 360 mg/L CaCO3.; EC50 (48 hr) water flea: 0.04 mg/L.

Aluminum (7429-90-5)

EC50 (48 hr) water flea: 1.4 mg/L.

Arsenic (7440-38-2)

LC50 (96 hr) rainbow trout: 13.34 mg/L. Cond: Static.; LC50 (96 hr) fathead minnow: 15.66 mg/L. Cond: Flow-through.; LC50 (96 hr) bluegill (juvenile): 41.76 mg/L. Cond: Flow-through; EC50 (48 hr) water flea: 3.80-5.28 mg/L. Cond: Static.

Environmental Fate

No information available for the product.

*** Section 13 - Disposal Considerations ***

US EPA Waste Number & Descriptions

A: General Product Information

This product contains a component or components identified as hazardous under 40 CFR 261.24.

B: Component Waste Numbers

Lead (7439-92-1)
RCRA: waste number D008; regulatory level = 5.0 mg/L
Arsenic (7440-38-2)
RCRA: waste number D004; regulatory level = 5.0 mg/L
Silver (7440-22-4)
RCRA: waste number D011; regulatory level = 5.0 mg/L

Disposal Instructions

Byproducts and residues from this product may be reprocessed or recycled. Upon disposal, collected dusts and other similar wastes could contain a constituent identified as a hazardous waste. Wastes must be tested using methods described in 40 CFR Part 261 to determine if it meets applicable definitions of hazardous wastes.

*** Section 14 - Transportation Information ***

US DOT Information

Shipping Name: Certain forms of this material (i.e. powders, borings, shavings, turnings, cuttings, dross, etc.) may be subject to U.S. DOT hazardous material shipping requirements. If products are shipped in quantities which exceed the reportable quantity (RQ) for individual components, they may also meet the requirements as DOT hazardous materials.
Hazard Class: Not available.
UN/NA #: Not available.
Packing Group: Not available.
Required Label(s): Not available.
Additional Info.: Not available.

*** Section 15 - Regulatory Information ***

US Federal Regulations

A: General Product Information

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication). The following component analysis applies only to those facilities that are required to report under applicable regulations.

B: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Zinc (7440-66-6)
SARA 313: form R reporting required for 1.0% de minimus concentration (only fume or dust)
CERCLA: final RQ = 1000 pounds (454 kg) (no reporting of releases of this hazardous substance is required if the diameter of the solid metal released is equal to or exceeds 0.004 inches)
Copper (7440-50-8)
SARA 313: form R reporting required for 1.0% de minimus concentration
CERCLA: final RQ = 5000 pounds (2270 kg) (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)
Manganese (7439-96-5)
SARA 313: form R reporting required for 1.0% de minimus concentration
Lead (7439-92-1)
SARA 313: form R reporting required for 0.1% de minimus concentration
CERCLA: final RQ = 10 pounds (4.54 kg)
Aluminum (7429-90-5)
SARA 313: form R reporting required for 1.0% de minimus concentration (fume or dust only)

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Nickel (7440-02-0)
SARA 313: form R reporting required for 0.1% de minimus concentration
CERCLA: final RQ = 100 pounds (45.4 kg) (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)

Arsenic (7440-38-2)
SARA 313: form R reporting required for 0.1% de minimus concentration
CERCLA: final RQ = 1 pound (0.454 kg) (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal release is equal to or exceeds 0.004 inches)

Silver (7440-22-4)
SARA 313: form R reporting required for 1.0% de minimus concentration
CERCLA: final RQ = 1000 pounds (454 kg) (no reporting of releases of this hazardous substance is required if the diameter of the solid metal released is equal to or exceeds 0.004 inches)

Antimony (7440-36-0)
SARA 313: form R reporting required for 1.0% de minimus concentration
CERCLA: final RQ = 5000 pounds (2270 kg) (no reporting of releases of this hazardous substance is required if the diameter of the pieces of solid metal released is equal to or exceeds 0.004 inches)

C: Component Marine Pollutants
This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Copper	7440-50-8	(as Copper metal powder); DOT regulated severe marine pollutant

State Regulations

A: General Product Information
Other state regulations may apply. Check individual state requirements.

B: Component Analysis - State
The following components appear on one or more of the following state hazardous substances lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Zinc	7440-66-6	Yes	Yes	Yes	No	Yes	Yes
Copper	7440-50-8	Yes	Yes	Yes	Yes	Yes	Yes
Manganese	7439-96-5	Yes	Yes	Yes	Yes	Yes	Yes
Lead	7439-92-1	Yes	Yes	Yes	Yes	Yes	Yes
Aluminum	7429-90-5	Yes	Yes	Yes	Yes	Yes	Yes
Tin	7440-31-5	Yes	Yes	Yes	Yes	Yes	Yes
Silicon	7440-21-3	No	No	Yes	Yes	Yes	Yes
Iron	7439-89-6	Yes	No	No	No	No	No
Nickel	7440-02-0	Yes	Yes	Yes	Yes	Yes	Yes
Arsenic	7440-38-2	Yes	Yes	Yes	Yes	Yes	Yes
Silver	7440-22-4	Yes	Yes	Yes	Yes	Yes	Yes
Antimony	7440-36-0	Yes	Yes	Yes	Yes	Yes	Yes

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):
WARNING! This product contains a chemical known to the state of California to cause cancer.
WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.

Other Regulations

A: General Product Information
No information available for the product.

B: Component Analysis - Inventory

Material Safety Data Sheet

Material Name: Brass Scrap

ID: NFE-0107

	CAS #	TSCA	DSL	EINECS
Zinc	7440-66-6	Yes	Yes	Yes
Copper	7440-50-8	Yes	Yes	Yes
Manganese	7439-96-5	Yes	Yes	Yes
Lead	7439-92-1	Yes	Yes	Yes
Aluminum	7429-90-5	Yes	Yes	Yes
Tin	7440-31-5	Yes	Yes	Yes
Silicon	7440-21-3	Yes	Yes	Yes
Iron	7439-89-6	Yes	Yes	Yes
Nickel	7440-02-0	Yes	Yes	Yes
Arsenic	7440-38-2	Yes	Yes	Yes
Silver	7440-22-4	Yes	Yes	Yes
Antimony	7440-36-0	Yes	Yes	Yes

C: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Copper	7440-50-8	1% item 433 (578)
Manganese	7439-96-5	1% item 974 (1077)
Lead	7439-92-1	0.1% item 937 (1435)
Aluminum	7429-90-5	1% item 47 (197)
Tin	7440-31-5	1% item 1571 (804)
Nickel	7440-02-0	0.1% item 1126 (1193)
Arsenic	7440-38-2	0.1% item 130 (266)

*** Section 16 - Other Information ***

Other Information

Reasonable care has been taken in the preparation of this information, but the manufacturer makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The manufacturer makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use.

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; TLV = Threshold Limit Value; NFPA = National Fire Protection Association; HMIS = High Efficiency Particulate Air; CERCLA = Comprehensive Environmental Response, Compensation and Liability Act; SARA = Superfund Amendments and Reauthorization Act.

This is the end of MSDS # NFE-0107

Material Safety Data Sheet

acc. to OSHA and ANSI

Printing date 07/14/2003 Reviewed on 04/25/2003

• 1 **Identification of substance:**

♦ **Product details:**

♦ **Product name:** Copper rod

♦ **Stock number:** 14126

♦ **Manufacturer/Supplier:**

Alfa Aesar, A Johnson Matthey Company
Johnson Matthey Catalog Company, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Emergency Phone: (978) 521-6300
CHEMTREC: (800) 424-9300
Web Site: www.alfa.com

♦ **Information Department:** Health, Safety and Environmental Department

♦ **Emergency information:**

During normal hours the Health, Safety and Environmental Department.
After normal hours call Chemtrec at (800) 424-9300.

• 2 **Composition/Data on components:**

♦ **Chemical characterization:**

Description: (CAS#)

Copper (CAS# 7440-50-8); 100%

♦ **Identification number(s):**

♦ **EINECS Number:** 231-159-6

• 3 Hazards identification

♦ **Hazard description:** · Not applicable

♦ **Information pertaining to particular dangers for man and environment**

Not applicable

♦ **Classification system**

♦ **HMIS ratings (scale 0-4)**

(Hazardous Materials Identification System)
Health (acute effects) = 0
Flammability = 0
Reactivity = 0

• 4 First aid measures

♦ **General information** No special measures required.

♦ **After inhalation** Seek medical treatment in case of complaints.

♦ **After skin contact** Generally the product does not irritate the skin.

♦ **After eye contact**

Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.

♦ **After swallowing** Seek medical treatment.

• 5 Fire fighting measures

♦ **Suitable extinguishing agents**

Product is not flammable. Use fire fighting measures that suit the surrounding fire.

♦ **Protective equipment:** No special measures required.

• 6 Accidental release measures

♦ **Person-related safety precautions:** Not required.

♦ **Measures for environmental protection:**

Do not allow material to be released to the environment without proper governmental permits.

♦ **Measures for cleaning/collecting:** Pick up mechanically.

♦ **Additional information:**

See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

• 7 Handling and storage

♦ **Handling**

♦ **Information for safe handling:**

Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
No special precautions are necessary if used correctly.

♦ **Information about protection against explosions and fires:**

No special measures required.

♦ **Storage**

♦ **Requirements to be met by storerooms and receptacles:**

No special requirements.

♦ **Information about storage in one common storage facility:** Not required.

♦ **Further information about storage conditions:** None.

8 Exposure controls and personal protection

♦ **Additional information about design of technical systems:**

No further data; see item 7.

Components with limit values that require monitoring at the workplace:

Copper fume, dusts and mists (as Cu)

	mg/m3
ACGIH TLV	1 (dust, mist); 0.2 (fume)
Austria MAK	1; 0.1 (fume)
Belgium TWA	0.2 (fume); 1 (dust)
Denmark TWA	0.1
Finland TWA	0.2 (fume); 1 (dust)
France VME	0.2 (fume); 1 (dust); 1; 2-STEL (dust)
Germany MAK	0.1 (fume); 1 (dust)
Hungary TWA	0.2; 0.4-STEL (dust)
Korea TLV	1 (dust, mist); 0.2 (fume)
Netherlands MAC-TGG	1 (dust)
Norway TWA	0.05; 0.1 (fume)
Poland TWA	0.1 (fume); 0.3-STEL (fume)
Russia	1-STEL (dust)
Sweden NGV	0.2 (resp. dust); 1 (total dust)
Switzerland MAK-W	0.1; 0.2-KZG-W (fume)
	1; 1-KZG-W
United Kingdom TWA	0.2 (fume)
	1; 3-STEL (dusts and mist)
USA PEL TWA	0.1 (fume); 1 (dusts and mists)

♦ **Additional information:** No data

♦ **Personal protective equipment**

♦ **General protective and hygienic measures**

The usual precautionary measures for handling chemicals should

be followed.

♦ **Breathing equipment:** Not required.

♦ **Protection of hands:** Not required.

♦ **Eye protection:** Safety glasses

♦ **Body protection:** Protective work clothing.

9 Physical and chemical properties:

♦ **General Information**

♦ **Form:** Rod

♦ **Color:** Copper colored

♦ **Odor:** Odorless

♦	Value/Range	Unit	Method
♦ **Change in condition**			
♦ **Melting point/Melting range:**	1083	° C	
♦ **Boiling point/Boiling range:**	2595	° C	
♦ **Sublimation temperature / start:**	Not determined		
♦ **Flash point:**	Not applicable		
♦ **Flammability (solid, gaseous)**	Product is not flammable.		

♦ **Ignition temperature:** Not determined

♦ **Decomposition temperature:** Not determined

♦ **Danger of explosion:**

Product does not present an explosion hazard.

♦ **Explosion limits:**

♦ **Lower:** Not determined

♦ **Upper:** Not determined

♦ **Vapor pressure:** Not determined

♦ **Density:** at 20 ° C 8.94 g/cm³

♦ **Solubility in / Miscibility with**

♦ **Water:** Insoluble

• 10 Stability and reactivity

♦ **Thermal decomposition / conditions to be avoided:**

Decomposition will not occur if used and stored according to specifications.

♦ **Materials to be avoided:**

Oxidizing agents
Acids

♦ **Dangerous reactions** No dangerous reactions known

♦ **Dangerous products of decomposition:** Metal oxide fume

• 11 Toxicological information

♦ **Acute toxicity:**

♦ **Primary irritant effect:**

♦ **on the skin:** Powder: irritant effect

♦ **on the eye:** Powder: irritant effect

♦ **Sensitization:** No sensitizing effects known.

♦ **Other information (about experimental toxicology):**

Reproductive effects have been observed on tests with laboratory animals.
Tumorigenic effects have been observed on tests with laboratory animals.

♦ **Subacute to chronic toxicity:**

Copper compounds may be irritating to the skin, eyes and respiratory tract. They may cause metal fume fever, hemolysis of the red blood cells and injury to the liver, lungs, kidneys and pancreas. Ingestion may also cause vomiting, gastric pain, dizziness, anemia, cramps, convulsions, shock, coma and death. Copper solutions may cause sensitization reactions.

♦ **Additional toxicological information:**

To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
EPA-D: Not classifiable as to human carcinogenicity: inadequate human and animal evidence of carcinogenicity or no data are available.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains tumorigenic and/or carcinogenic and/or neoplastic data for components in this product.

• 12 Ecological information:

♦ **General notes:**

Do not allow material to be released to the environment without proper governmental permits.

• 13 Disposal considerations

♦ **Product:**

♦ **Recommendation**

Consult state, local or national regulations to ensure proper disposal.

♦ **Uncleaned packagings:**

♦ **Recommendation:**

Disposal must be made according to official regulations.

• 14 Transport information

Not a hazardous material for transportation.

♦ **DOT regulations:**

♦ **Hazard class:** None

♦ **Land transport ADR/RID (cross-border)**

♦ **ADR/RID class:** None

♦ **Maritime transport IMDG:**

♦ **IMDG Class:** None

♦ **Air transport ICAO-TI and IATA-DGR:**

♦ **ICAO/IATA Class:** None

♦ **Transport/Additional information:**

Not dangerous according to the above specifications.

• **15 Regulations**

♦ **Product related hazard informations:**

Observe the general safety regulations when handling chemicals

♦ **National regulations**

All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.

♦ **Information about limitation of use:**

For use only by technically qualified individuals.
This product contains copper and is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.

• **16 Other information:**

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

♦ **Department issuing MSDS:** Health, Safety and Environmental Department.

• Contact: Darrell R. Sanders

SUBSTANCE: COPPER SCRAP

MSDS NO.: 3582-7

HEALTH HAZARDS

Inhalation or ingestion of dusts or fumes generated from this material may result in irritation of the upper respiratory tract, fever, chills, and muscular aches. Gastrointestinal tract irritation producing nausea, vomiting, gastric pain, and diarrhea may result from over exposure. This material may contain metals which have been determined to cause cancer including nickel, beryllium, cadmium, chromium, lead, and arsenic.

DANGER:MAY CONTAIN INORGANIC ARSENIC--CANCER HAZARD--HARMFUL IF INHALED OR SWALLOWED--USE ONLY WITH ADEQUATE VENTILATION OR RESPIRATORY PROTECTION.

PHYSICAL HAZARDS	PERSONAL PROTECTION
Heavily concentrated dust clouds of this material may be explosive. Molten metal reacts violently with water.	RESPIRATORY PROTECTION - for airborne dust or fume EYE PROTECTION GLOVES

SUPPLIER: METALS RECYCLING, INC.

ADDRESS: 89 CELIA STREET

CITY, STATE, ZIP: JOHNSTON, RI 02919

EMERGENCY TELEPHONE NO.: 401-831-7799

For More Information, Read Material Safety Data Sheet

COPPER, SCRAP

GENERAL: Reddish-color metal found as a component in electric wiring; switches; and plumbing, heating, roofing, and building supplies.

POTENTIAL HAZARDS:

-Aerosolized particles
-Explosive dust
-Sharp objects/edges

PROTECTIVE EQUIPMENT:

Workers:
- -Hardhats
- -Eye/face protection
- -Safety shoes/boots
- -Gloves *(rubber when oil/solutions will be handled)*

As Needed:
- *-Respirator: air-purifying*

SAFETY PROCEDURES:

As needed, establish a written program regarding the selection and use of respirators in compliance with applicable OSHA standard.

As needed, establish a written program, including monitoring, for compliance with OSHA Standard for Inorganic Arsenic [0.01 mg/m^3 (10 µg/m^3) TWA].

As needed, establish a written program, including monitoring, for compliance with OSHA Standard for Lead [0.05 mg/m^3 (50 µg/m^3) TWA].

As needed, establish a written program, including monitoring, for compliance with OSHA Standard for Cadmium [0.005 mg/m^3 (5 µg/m^3) TWA].

As needed establish a written program, including monitoring, to ensure that exposure to the following substances does not exceed the noted levels:

Aluminum:	
Total Dust:	**15 mg/m³ (15,000 µg/m³) TWA**
Respirable Fraction:	**5 mg/m³ (5,000 µg/m³) TWA**
Beryllium:	**2 µg/m³ TWA/5 µg/m³ ceiling 25 µg/m³ maximum peak above ceiling (30 minutes)**
Chromium:	**1 mg/m³ (1,000 µg/m³) TWA**
Cobalt:	**0.1 mg/m³ (100 µg/m³) TWA**
Copper:	
Fumes:	**0.1 mg/m³ (100 µg/m³) TWA**
Dust/Mist:	**1 mg/m³ (1,000 µg/m³) TWA**
Iron Oxide:	
Total Particulates:	**10 mg/m³ (10,000 µg/m³) TWA**
Nickel:	**1 mg/m³ (1,000 µg/m³) TWA**
Silver:	**0.01 mg/m³ (10 µg/m³) TWA**
Tin:	**2 mg/m³ (2,000 µg/m³) TWA**

Eye wash should be in close proximity to copper dust producing areas, with visible signs indicating its location.

Portable fire extinguisher should be in close proximity to copper dust producing areas, with visible signs indicating its location.

For Physical Hazards, Health Hazards, and Emergency Action, Consult Material Safety Data Sheet for Copper Scrap.

SAFETY PROCEDURES:

Motors and other electrical equipment in close proximity to fuel storage must be grounded to prevent electrical shock or ignition of flammable fumes, dust, or mist.

Portable fire extinguisher should be in close proximity to fuel storage, with visible signs indicating its location.

As needed, establish a written program regarding the selection and use of respirators in compliance with applicable OSHA standard.

Post and enforce "No Smoking" policy in area of gas storage.

Tagout procedure should be in place for fuel tanks and valves prior to equipment maintenance.

If located indoors, the area used for fuel storage should have forced-air ventilation exhausted to the outside of the building.

Exhaust ducts should not discharge near doors, windows, or other air intakes in a manner that will permit reentry of effluents into a building.

Eye wash should be in close proximity to area where splashes could occur with visible signs indicating its location.

Showers should be in close proximity to area where splashes could occur with visible signs indicating their location.

Post warning signs indicating area of fuel storage and proximity restrictions or authorizations.

Main shut-off valve should be easily accessible and clearly defined.

Post sign indicating type of fuel stored at entrance to storage building.

Use only nonsparking tools in area of gas storage.

Regularly monitor temperature readings in area of bulk fuel storage.

Establish a written procedure for regular monitoring for fuel leaks.

Physical Hazards:

-extremely flammable, compressed gas. May be ignited by heat, sparks, or flames;

-vapors may travel to a source of ignition and flash back; and

-containers may explode in heat of fire.

Health Hazards:

-vapors may cause dizziness or suffocation; and

-fire may produce irritating or poisonous gases.

Emergency Action:

Fire/Explosion:

-isolate area, deny employees entrance/access;

-keep individuals upwind and out of low areas; and

-for small fires use dry chemical or carbon dioxide extinguishers if such can be used from a point of safety.

Spill/Leak:

-shut off/prohibit ignition sources;

-stop leak if such can be done from a point of safety;

-use water spray to reduce vapors; and

-ventilate closed spaces.

First Aid:

-move victim to fresh air;

-call for emergency medical care;

-support victim with oxygen or artificial respiration as necessary; and

-keep victim quiet, maintain normal body temperature.

Material Safety Data Sheet
Copper, powder or dust

ACC# 05430

Section 1 - Chemical Product and Company Identification

MSDS Name: Copper, powder or dust
Catalog Numbers: S93199, C431-500, C434-500
Synonyms: None.
Company Identification:
Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410
For Information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7440-50-8	Copper	100	231-159-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: red to brown powder.
Warning! Flammable solid. Can be explosive when exposed to heat or flames. Causes respiratory tract irritation. Causes eye and skin irritation. May cause lung damage. Inhalation of fumes may cause metal-fume fever. May cause liver and kidney damage.
Target Organs: Kidneys, liver, lungs.

Potential Health Effects
Eye: Causes eye irritation.
Skin: Causes skin irritation. May cause skin discoloration.
Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver and kidney damage.
Inhalation: Dust is irritating to the respiratory tract. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count.
Chronic: Prolonged or repeated skin contact may cause dermatitis. May cause liver and kidney damage. May cause lung damage.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.
Ingestion: Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Individuals with Wilson's disease are more susceptible to chronic copper poisoning.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dust can be an explosion hazard when exposed to heat or flame. Flammable solid. May burn rapidly with flare burning effect. May re-ignite after fire is extinguished. Finely divided dusts may exhibit pyrophoric tendencies.
Extinguishing Media: Use dry sand, Met-L-X powder, or G-1 graphite powder. Contact professional fire-fighters immediately. Use dry sand, graphite powder, dry sodium chloride-based extinguishers. Dousing metallic fires with water may generate hydrogen gas, an extremely dangerous explosion hazard, particularly if fire is in a confined environment.
Flash Point: Not applicable.
Autoignition Temperature: Not applicable.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 2; Flammability: 2; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Scoop up with a nonsparking tool, then place into a suitable container for disposal. Avoid generating dusty conditions. Remove all sources of ignition.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.
Storage: Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Do not expose to air.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Copper	0.2 mg/m3 TWA (fume); 1 mg/m3 TWA (dust and mist, as Cu)	1 mg/m3 TWA (dust and mist) 100 mg/m3 IDLH (dust, fume and mist)	0.1 mg/m3 TWA (fume); 1 mg/m3 TWA (dust and mist)

OSHA Vacated PELs: Copper: 0.1 mg/m3 TWA (fume, dusts, mists as Cu)

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder
Appearance: red to brown
Odor: none reported
pH: Not available.
Vapor Pressure: 1 mm Hg @1628C
Vapor Density: Not available.
Evaporation Rate: Not applicable.
Viscosity: Not applicable.
Boiling Point: 2595 deg C
Freezing/Melting Point:1083 deg C
Decomposition Temperature: Not available.
Solubility: Insoluble in water.
Specific Gravity/Density: 8.92
Molecular Formula: Cu
Molecular Weight:63.54

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Ignition sources, dust generation, moisture, exposure to air, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Copper fumes.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 7440-50-8: GL5325000; GL7440000; GL7590000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 7440-50-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.
Teratogenicity: No data available.
Reproductive Effects: No data available.
Mutagenicity: No data available.
Neurotoxicity: No data available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	METAL POWDERS, FLAMMABLE, N.O.S.	METAL POWDER, FLAMMABLE, N.O.S. (Copper)
Hazard Class:	4.1	4.1
UN Number:	UN3089	UN3089
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 7440-50-8 is listed on the TSCA Inventory.

Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
CAS# 7440-50-8: 5000 lb final RQ (no reporting of releases of this hazardous substance is requir
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 7440-50-8: immediate, delayed, fire.
Section 313
This material contains Copper (CAS# 7440-50-8, 100%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.
Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.
CAS# 7440-50-8 is listed as a Priority Pollutant under the Clean Water Act. CAS# 7440-50-8 is listed as a Toxic Pollutant under the Clean Water Act.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 7440-50-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives
Hazard Symbols:
Not available.
Risk Phrases:

Safety Phrases:
S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)
CAS# 7440-50-8: 0
Canada - DSL/NDSL
CAS# 7440-50-8 is listed on Canada's DSL List.
Canada - WHMIS
This product has a WHMIS classification of D2B, B4.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.
Canadian Ingredient Disclosure List
CAS# 7440-50-8 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 12/12/1997
Revision #6 Date: 3/16/2007

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

SUBSTANCE: GLASS

MSDS NO.: 3582-26

HEALTH HAZARDS

Inhalation of high concentrations of this material may cause lung damage and eye, skin, and respiratory information.

PHYSICAL HAZARDS	PERSONAL PROTECTION
Cuts on sharp edges are possible.	SAFETY GLASSES GLOVES RESPIRATORS - in high concentrations

SUPPLIER: METALS RECYCLING, INC.

ADDRESS: 89 CELIA STREET

CITY, STATE, ZIP: JOHNSTON, RI 02919

EMERGENCY TELEPHONE NO.: 401-831-7799

For More Information, Read Material Safety Data Sheet

GLASS, SCRAP

GENERAL: Ceramic material consisting of silica (sand), sodium carbonate (soda ash), and calcium oxide (lime).

POTENTIAL HAZARDS:
- -Aerosolized particles
- -Dust
- -Sharp objects/edges

PROTECTIVE EQUIPMENT:

Workers:
- -Hardhats
- -Eye/face protection
- -Safety shoes/boots
- -Gloves *(rubber when oil/solutions will be handled)*

As Needed:
- *-Respirator: air-purifying*

SAFETY PROCEDURES:

As needed, establish a written program regarding the selection and use of respirators in compliance with applicable OSHA standard.

As needed, establish a written program, including monitoring, to ensure that exposure to the following substances does not exceed the noted levels:

Calcium Oxide: 5 mg/m^3 (5,000 µg/m^3) TWA
Particulates: not otherwise regulated
Total Dust: 15 mg/m^3 (15,000 µg/m^3) TWA
Respirable Fraction: 5 mg/m^3 (5,000 µg/m^3) TWA
Silica:
Amorphous: 6 mg/m^3 (6,000 µg/m^3) TWA

Eye wash should be in close proximity to dust producing areas, with visible signs indicating its location.

For Physical Hazards, Health Hazards, and Emergency Action, consult Material Safety Data Sheet for Glass Scrap.

SUBSTANCE: IRON SCRAP

MSDS NO.: 3582-24

HEALTH HAZARDS

Inhalation or ingestion of dusts or fumes generated from this material may cause fever, chills, and muscular aches. Chronic exposures may result in non-disabling changes in lung X-rays caused by a condition known as siderosis. Chronic exposures to high concentrations may result in central nervous system damage. This material may contain metals which have been determined to cause cancer, including arsenic, chromium, lead, and nickel.

DANGER:MAY CONTAIN INORGANIC ARSENIC--CANCER HAZARD--HARMFUL IF INHALED OR SWALLOWED--USE ONLY WITH ADEQUATE VENTILATION OR RESPIRATORY PROTECTION.

PHYSICAL HAZARDS

Heavily concentrated dust clouds of this material may be explosive. Molten metal reacts violently with water.

PERSONAL PROTECTION

RESPIRATORY PROTECTION - for airborne dust or fume
EYE PROTECTION
GLOVES

SUPPLIER: METALS RECYCLING, INC.

ADDRESS: 89 CELIA STREET

CITY, STATE, ZIP: JOHNSTON, RI 02919

EMERGENCY TELEPHONE NO.: 401-831-7799

For More Information, Read Material Safety Data Sheet

IRON, SCRAP

GENERAL: Malleable magnetic metal found in construction materials, auto parts, and magnets.

POTENTIAL HAZARDS:

-Aerosolized particles
-Flammable dust
-Hazardous fumes
-Sharp objects/edges

PROTECTIVE EQUIPMENT:

Workers:

-Hardhats
-Eye/face protection
-Safety shoes/boots
-Gloves *(rubber when oil/solutions will be handled)*

As Needed:

-Respirator: air-purifying

SAFETY PROCEDURES:

As needed, establish a written program regarding the selection and use of respirators in compliance with applicable OSHA standard.

As needed, establish a written program, including monitoring, for compliance with OSHA Standard for Inorganic Arsenic [0.01 mg/m^3 (10 μg/m^3) TWA].

As needed, establish a written program, including monitoring, for compliance with OSHA Standard for Lead [0.05 mg/m^3 (50 μg/m^3) TWA].

As needed, establish a written program, including monitoring, to ensure that exposure to the following substances does not exceed the noted levels:

Aluminum:
Total Dust: 15 mg/m³ (15,000 µg/m³) TWA
Respirable Fraction: 5 mg/m³ (5,000 µg/m³) TWA
Boron Oxide:
Total Dust: 15 mg/m³ (15,000 µg/m³) TWA
Calcium Oxide: 5 mg/m³ (5,000 µg/m³) TWA
Chromium: 1 mg/m³ (1,000 µg/m³) TWA
Cobalt: 0.1 mg/m³ (100 µg/m³) TWA
Copper:
Fumes: 0.1 mg/m³ (100 µg/m³) TWA
Dust/Mist: 1 mg/m³ (1,000 µg/m³) TWA
Iron Oxide:
Total Particulates: 10 mg/m³ (10,000 µg/m³) TWA
Molybdenum:
Total Dust: 15 mg/m³ (15,000 µg/m³) TWA
Nickel: 1 mg/m³ (1,000 µg/m³) TWA
Silicon:
Total Dust: 15 mg/m³ (15,000 µg/m³) TWA
Respirable Fraction: 5 mg/m³ (5,000 µg/m³) TWA
Tin: 2 mg/m³ (2,000 µg/m³) TWA
Vanadium Oxide:
Dust: 0.5 mg/m³ (500 µg/m³) STEL
Fumes: 0.1 mg/m³ (500 µg/m³) STEL
Zirconium: 5 mg/m³ (5,000 µg/m³) TWA

Eye wash should be in close proximity to iron dust producing areas, with visible signs indicating its location.

Avoid contact by molten metal with water because the combination may react violently.

For Physical Hazards, Health Hazards, and Emergency Action, consult Material Safety Data Sheet for Iron Scrap.

SUBSTANCE: LEAD SCRAP

MSDS NO.: 3582-22

HEALTH HAZARDS

Inhalation or ingestion of dusts or fumes generated from this material may cause eye irritation, weakness, and gastrointestinal disorders. Chronic over exposures may result in central nervous system damage, kidney damage, blood disorders, and changes in gingival tissue. This material may contain metals which have been determined to cause cancer, including lead, arsenic, and cadmium.

DANGER:MAY CONTAIN INORGANIC ARSENIC--CANCER HAZARD--HARMFUL IF INHALED OR SWALLOWED--USE ONLY WITH ADEQUATE VENTILATION OR RESPIRATORY PROTECTION.

PHYSICAL HAZARDS

Heavily concentrated dust clouds of this material may be explosive. Molten metal reacts violently with water.

PERSONAL PROTECTION

RESPIRATORY PROTECTION - for airborne dust or fume
EYE PROTECTION
GLOVES

SUPPLIER: METALS RECYCLING, INC.

ADDRESS: 89 CELIA STREET

CITY, STATE, ZIP: JOHNSTON, RI 02919

EMERGENCY TELEPHONE NO.: 401-831-7799

For More Information, Read Material Safety Data Sheet

LEAD, SCRAP

GENERAL: Naturally occurring soft, gray solid metal that can be found in storage batteries, radiation shielding, cable covering, ammunition, solder and fusible alloys, paint, brass, bronze, and copper. Also found in air release or flue dust in brass, bronze, and copper smelting, primary and secondary lead smelting, flame-torch cutting and welding or grinding of lead-painted surfaces, and abrasive blasting of bridges and other steel structures containing lead-based paints.

POTENTIAL HAZARDS:

- -Aerosolized particles
- -Dust
- -Explosive fine particles
- -Hazardous fumes
- -Sharp objects/edges

PROTECTIVE EQUIPMENT:

As Needed:

- *-Hardhats*
- *-Eye/face protection*
- *-Safety shoes/boots*
- *-Gloves (rubber when oil/solutions will be handled)*
- *-Respirator (as specified)*
- *-Coveralls/full-body work clothing*

SAFETY PROCEDURES:

Motors and other electrical equipment must be grounded to prevent electrical shock or ignition of flammable fumes, dust, or mist.

As needed, establish a written program regarding the selection and use of respirators in compliance with applicable OSHA standard.

As needed, establish a written program, including monitoring, for compliance with OSHA Standard for Inorganic Arsenic [0.01 mg/m^3 (10 μg/m^3) TWA].

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As needed, establish a written program, including monitoring, for compliance with OSHA Standard for Cadmium [0.005 mg/m^3 (5 μg/m^3) TWA].

As needed, establish a written program, including monitoring, to ensure exposure to the following substances do not exceed the noted levels:

Antimony:	**0.5 mg/m^3 (500 μg/m^3) TWA**
Copper:	
Fumes:	**0.1 mg/m^3 (100 μg/m^3) TWA**
Dust/Mist:	**1 mg/m^3 (1,000 μg/m^3) TWA**
Silver:	**0.01 mg/m^3 (10 μg/m^3) TWA**
Tin:	**2 mg/m^3 (2,000 μg/m^3) TWA**

Post and enforce "No Smoking" policy in lead dust producing area.

Eye wash should be in close proximity to lead dust producing areas, with visible signs indicating its location.

Portable fire extinguisher should be in close proximity to lead dust producing areas with visible signs indicating its location.

For Physical Hazards, Health Hazards, and Emergency Action, consult Material Safety Data Sheet for Lead Scrap.

As needed, establish a written program, including monitoring, for compliance with OSHA Standard for Lead [0.05 mg/m^3 (50 μg/m^3) TWA].

Program must include:

<u>Monitoring</u>

Each employer who has a workplace or a work operation that could present exposure of employees to lead must monitor each such workplace and work operation to determine airborne concentration of lead to which an employee may be exposed.

If initial monitoring reveals employee exposure to be below the action level (30 μg/m^3 TWA), no additional monitoring is required unless there has been a production, process, control or personnel change that may result in new or additional

exposure to lead.

If initial or subsequent monitorings reveal employee exposure to be above the action level (30 $\mu g/m^3$ TWA) yet below the Permissible Exposure Limit (PEL) (see Table #1) the employer must repeat monitorings at least every 6 months.

If initial or subsequent monitorings reveal employee exposure to be above the PEL, the employer must repeat monitorings at least quarterly.

Employer must continue monitoringe until two consecutive measurements, taken at least 7 days apart, are below the action level at which time the employer may discontinue monitorings for that employee until there has been a product, process, control, or personal change that may result in new or additional exposure to lead.

Table 1

Permissible airborne lead levels by industry ($\mu g/m^3$)*	Effective date					
	Mar. 1, 1979	Mar. 1, 1980	Mar. 1, 1981	Mar. 1, 1982	Mar. 1, 1984	Mar. 1, 1989 (final)
1. Primary lead production	200	200	200	100	100	50
2. Secondary lead production	200	200	200	100	50	50
3. Lead-acid battery manufacturing	200	200	100	100	50	50
4. Nonferrous foundries	200	100	100	100	50	50
5. Lead pigment manufacturing	200	200	200	100	50	50
6. All other industries	200	50	50	50	50	50

* Airborne levels to be achieved without reliance on respirator protection through a combination of engineering, work practice and other administrative controls. While these controls are being implemented, respirators must be used to meet the 50 $\mu g/m^3$ exposure limit.

Employee Notification

Within five 5 working days after the receipt of monitoring results, the employer must notify each employee in writing of the results that represent that employee's exposure.

Whenever the monitoring results indicate that an employee's exposure exceeds the PEL, the employer must include in the written notice a statement that the PEL was exceeded and a description of the corrective action taken to reduce exposure to or below the PEL.

Compliance Methods

If an employee is exposed to lead above the PEL for more than 30 days per year, the employer must implement engineering and

work practice controls (including administrative controls) to reduce and maintain employee exposure to lead except to the extent that the employer can demonstrate that such controls are not feasible.

Wherever the engineering and work practice controls are not sufficient to reduce employee exposure to or below the PEL, the employer must supplement employee protection by the use of respirators.

Where any employee is exposed to lead above the PEL for only 30 days or less per year, the employer must implement engineering controls to reduce exposures to 200 $\mu g/m^3$ followed, as needed, by work practice controls and respirators so as to reduce employee exposure to lead to or below the PEL.

A written program must be established which outlines:

- description of each operation that emits lead;
- monitoring data that documents the source of lead emissions;
- engineering and work practice controls in place to reduce employee exposure to lead;
- description of required programs for protective work clothing and equipment, housekeeping, and hygiene facilities and practices; and
- description of administrative controls, if used, as a means of reducing employee exposure to lead.

Respiratory Protection

Respirators must be used by employees in work operations where feasible engineering and work practice controls do not reduce exposure to below the PEL.

Respirators must be supplied to and maintained at no cost to employees.

Respirators must meet the following criteria:

Concentration of Lead	Required Respirator
Not greater than 0.5 mg/m³ (10 X PEL)	Half-mask, air-purifying respirator equipped with high-efficiency filters
Not greater than 2.5 mg/m³ (50 X PEL)	Full facepiece air-purifying respirator equipped with high-efficiency filters
Not greater than 50 mg/m³ (1000 X PEL)	Powered air-purifying respirators with high-efficiency filters, or half-mask supplied-air respirators operated in positive pressure mode
Not greater than 100 mg/m³ (2000 X PEL)	Supplied-air respirator with full facepiece, hood, or helmet or suit and operated in positive pressure mode
Unknown or greater than 100 mg/m³	Full facepiece, self-contained breathing apparatus operated in positive pressure mode

Respirator usage must comply with all requirements of the OSHA Respiratory Protection Standard (see: *Respiratory Protection*)

<u>Work Clothing/Equipment</u>

At no cost to the employee, employer must provide the following to all employees exposed to lead above the PEL without regard to the use of respirators or where the possibility of skin or eye irritation from lead exists:

- **coveralls or similar full-body work clothing;**
- **gloves, hats, and shoes or disposable shoe coverlets;**
- **eye/face protection; and**
- **freshly laundered protective clothing for exposures**

- above the PEL: weekly,
- greater than 200 $\mu g/m^3$ TWA: daily.

Employer must ensure that protective clothing is repaired or replaced as needed.

Employer must ensure that employees remove protective clothing at the completion of the work shift only in prescribed change rooms.

Employer must ensure that contaminated protective clothing is placed in a closed container in the prescribed change room. This container must prevent dispersion of lead outside of the container.

Employer must ensure that containers of contaminated clothing removed from the workplace are labeled as follows:

> Caution: Clothing contaminated with lead; do not remove dust by blowing or shaking. Dispose of lead-contaminated wash water in accordance with applicable local, state or federal regulations.

Employer must inform in writing person who cleans or launders contaminated clothing of the potential harmful effects of exposure to lead.

Employer must prohibit the removal of lead from protective clothing or equipment by blowing or shaking.

Housekeeping

All surfaces must be maintained as free as practicable of accumulations of lead.

Employer must have a written housekeeping and maintenance plan dealing with cleaning of surfaces, dust collection, and ventilation equipment.

Floors and other surfaces where lead accumulates may not be cleaned by the use of compressed air.

Shoveling, dry or wet sweeping, and brushing may be used only

where vacuuming or other equally effective methods have been tried and found not to be effective.

Where vacuuming methods are selected, the vacuum must be used and emptied in a manner that minimizes the re-entry of lead into the workplace.

Hygiene Facility/Practice

Employer must ensure that in areas where employees are exposed to lead above the PEL, without regard to the use of respirators, that:

- food or beverage is not present or consumed, tobacco products are not present or used, and cosmetics are not applied, except in change rooms, lunchrooms, or showers;
- employees shower at the end of their work shift;
- employees required to shower do not leave the workplace wearing clothing or equipment worn during the work shift; and
- employees wash their hands and face prior to eating, drinking, smoking, or applying cosmetics.

Employer must provide the following for employees who work in areas where employees are exposed to lead above the PEL, without regard to respirators:

- change room equipped with separate storage facilities for protective work clothing and equipment and for street clothes that prevent cross-contamination;
- showers and lavatories, and
- lunchroom facilities that are accessible to employees and that have a temperature controlled, positive pressure, filtered air supply.

Medical Surveillance

Employer must institute a medical surveillance program for all employees who are or may be exposed above the action level (30 $\mu g/m^3$ TWA) for more than 30 days per year.

Employer must ensure that all medical examinations and procedures are performed by or under the supervision of a licensed physician without cost to employees. Medical examinations, follow-up, and reporting must contain the elements outlined in 29 CFR 1910.1025 (j)(3)(ii) - (vi).

The required medical surveillance program must include blood sampling and analysis for lead and zinc protoporphyrin levels on the following schedule:

- If an employee is exposed to lead above the action level for more than 30 days per year sampling must be repeated at least every six 6 months;
- If an employee's blood lead level is at or above 40 $\mu g/100g$, blood sampling must be repeated at least every 2 months;
- at least monthly during the period that an employee is removed because of an elevated blood lead level.

The required medical surveillance program must include medical examinations and consultation, at no cost to the employee, as follows:

- at least annually for each employee for whom a blood sampling test in the preceding 12 months indicated a blood lead level at or above 40 $\mu g/100g$;
- prior to an employee's first assignment to an area where the airborne lead concentrations are above the action level (30 $\mu g/m^3$);
- as soon as possible upon notification by an employee either that the employee has developed signs or symptoms commonly associated with lead

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intoxication, that the employee desires medical advice concerning the effects of current or past exposure to lead on the employee's ability to procreate a healthy child, or that the employee has demonstrated difficulty in breathing during a respirator fitting test or during use of a respirator; and

- as medically appropriate for each employee removed because of exposure to lead for medical reasons.

Employee Notification

Within 5 working days after the receipt of monitoring results, the employer must notify each employee in writing of the results that represent that employee's exposure.

Within 5 working days after the receipt of biological monitoring results, the employer must notify in writing each employee whose blood lead level exceeds 40 μg/100g. The notification must include:

- employee's blood lead level; and
- notification that the OSHA standard requires temporary medical removal with medical removal protection benefits when an employee's blood lead level exceeds the numerical criterion for medical removal.

Medical Removal Protection

Employer must remove from work exposure to lead any employee having an exposure to lead at or above the action level (30 μg/m^3) when the average of the last 3 blood samples or the average of all blood samples for the previous 6 months (whichever is longer) indicates the employee's blood lead level is at or above 50 μg/100g. The employee need not be removed if the last blood sampling indicates a blood lead level at or below 40 μg/100g.

Employer must remove from work exposure to lead any employee having an exposure to lead at or above the action

level (30 $\mu g/m^3$) on each occasion when a final medical determination results in the finding that the employee has a detected medical condition that places the employee at increased risk of material impairment to health from exposure to lead.

The employer must return an employee to his or her former job status as follows:

- for an employee removed due to a blood lead level at or above 80 μg/100g– when 2 consecutive blood tests indicate a blood lead level at or below 60 μg/100g;

- for an employee removed due to blood lead level at or above 70 μg/100g– when 2 consecutive blood tests indicate a blood lead level at or below 50 μg/100g;

- for an employee removed due to a blood lead level at or above 60 μg/100g, or due to an average blood lead level at or above 50 μg/100g– when two (2) consecutive blood tests indicate a blood lead level at or below 40 μg/100g;

- for an employee removed due to a final medical determination–when a subsequent medical determination finds that the employee no longer has a detected medical condition that places the employee at increased risk of material impairment to health from exposure to lead.

Employer must provide to an employee up to 18 months of medical removal protection benefits on each occasion that the employee is removed from exposure to lead. Medical removal benefits means that the employer must maintain the earnings, seniority, and other employment rights and benefits of an employee as though the employee had not been removed from lead exposure.

<u>Employee Information/Training</u>

Employer must institute a training program for all employees who are subject to exposure of lead above the action level,

without respirators. The training program must consist of:

- a review of the OSHA Standard for Lead, including appendixes A & B (29 CFR 1910.1025); and
- the specific nature of the operations that could result in employee exposure to lead above the action level;
- the quantity, location, manner of use, storage, sources of exposure, and the specific nature of operations that could result in exposure to lead as well as any necessary protective steps;
- the purpose, proper use, and limitation of respirators;
- the purpose and a description of the medical surveillance program; and
- the engineering controls and work practices associated with the employee's job assignment.

The training program must be repeated at least annually for each covered employee.

Signs

Employer must post the following warning sign in each work area where the PEL is exceeded:

Warning
Lead Work Area
Poison
No Smoking or Eating

Required signs must be illuminated and cleaned as necessary so as to be readily visible.

Recordkeeping

Employer must maintain detailed and accurate records of exposure monitoring and medical surveillance for at least 40 years or for the duration of each employee's employment plus 20 years, whichever is longer.

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MARMON/KEYSTONE CORPORATION

THE PIPE AND TUBING PEOPLE

P.O. BOX 992, Butler, PA 16001
EMERGENCY PHONE NUMBER (412) 283-3000

ISSUE DATE: JANUARY 1, 1998

MATERIAL SAFETY DATA SHEET

TRADE NAME (Common Name or Synonym)
Nickel Based Alloy Steel

CHEMICAL NAME
Alloys 200, 400, 600, 800 series

I. INGREDIENTS

NOTE: PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HAZARD FOR USERS

Ingredients	CAS Number	TLV (2)	Ingredients	CAS Number	TLV (2)
Aluminum (Al)	7429-90-5	10	Nickel (Ni)	7440-02-0	1
Chromium (Cr)	7440-47-3	.5	Niobium (Nb)	7440-03-1	None Established
Cobalt (Co)	7440-48-4	.1 (Dust & Fume)	Silicon (Si)	7440-21-3	10 (Total Dust)
Copper (Cu)	7440-50-8	1 (Dust & Fume)	Tantalum (Ta)	7440-25-7	5
Iron (Fe)	1309-37-1	10 (As Oxide-Iron)	Titanium (Ti)	7440-32-6	10 (Total Dust)
Manganese (Mn)	7439-96-5	5 (As Dust-Ceiling)	Tungsten (W)	7440-33-7	5
Molybdenum (Mo)	7439-98-7	10 (Insoluble Comp.)	Yttrium (Y)	7440-65-5	1

% Alloying Elements (1)

UNS Numbers	Al	Cr	Co	Cu	Fe	Mn	Mo	Ni	Nb	Si	Ta	Ti	W	Y
N02200 series (Commercially Pure Ni Alloy)		<2				<5		95-99				<5	<5	
N04400-N05500 Series (Ni-Cu Alloy)	<5	<1		27-68	<1	<5		31-67		<1	<2			
N06600-N07700 Series (Ni-Cr Alloy)	<5	15-48	0-13		1-40	<5	2-10	39-80	<5		<3	<3	<5	<1
N08800-N09900 Series (Ni-Fe-Cr Alloy)	<5	.1-30	0-15	<2	30-84	<1	<5	.1-42	<5			<3		<1

(1) % OF ALLOYING MATERIAL VARIES WITH GRADE OF MATERIAL (2) 1985-1988 ACGIH THRESHOLD LIMIT VALUE

II. PHYSICAL DATA

MATERIAL IS (At Normal Conditions)	APPEARANCE AND ODOR	% VOLATILE BY VOLUME	VAPOR DENSITY
☐ LIQUID ■ SOLID ☐ GAS ☐ OTHER	Grey-Black, Odorless	N/A	N/A

ACIDITY/ALKALINITY			VAPOR PRESSURE
pH = N/A	Melting Point Approx. 2300 °F Boiling Point N/A °F	Specific Gravity (H_2O) = 1) Approx. 7 Solubility in water (% by weight) N/A	(mm Hg at 20° C) N/A

III. PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION Appropriate dust/mist/fume respirator should be used to avoid excessive inhalation of particulates. If exposure limits are exceeded or exceeded, use NIOSH approved equipment.	HANDS, ARMS AND BODY Protective gloves should be worn as required for welding, burning or handling operations.
EYES AND FACE Safety glasses should be worn when grinding or cutting. Face shields should be worn when welding or cutting.	OTHER CLOTHING AND EQUIPMENT As required depending on operations and safety codes.

IV. EMERGENCY MEDICAL PROCEDURES

INHALATION:	Remove to fresh air; if condition continues, consult a physician.
EYE CONTACT:	Flush thoroughly with running water to remove particulate; obtain medical attention if irritation persists.
SKIN CONTACT:	Remove particles by washing thoroughly with soap and water. Seek medical attention if condition persists.
INGESTION:	If significant amounts of metal are ingested, consult physician.

V. HEALTH/SAFETY INFORMATION

Health

Short term exposure to fumes/dust may produce irritation of eyes and respiratory system. Inhalation of high concentrations of freshly formed oxide fumes or iron, manganese and copper may cause metal fume fever characterized by a metallic taste in the mouth, dryness and irritation of the throat and influenza-like symptoms.

Chronic inhalation of high concentrations of iron-oxide fumes or dust may lead to a benign pneumoconiosis (siderosis). Inhalation of high concentrations of ferric oxide may possibly enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens.

Chromium and nickel and their compounds are listed in the 3rd Annual Report on carcinogens, as prepared by the National Toxicology Program (NTP). Exposure to high concentrations of dust and fumes can cause sensitization dermatitis, inflammation and/or ulceration of upper respiratory tract and possibly cancer of the nasal passages and lungs.

Recent epidemiological studies of workers melting and working alloys containing nickel/chromium have found no increased risk of cancer.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Individuals with chronic respiratory disorders (i.e.: asthma, chronic bronchitis, emphysema, etc.) may be adversely affected by and fume or airborne particulate matter exposure.

Fire and Explosion

FLASH POINT	AUTO IGNITION TEMPERATURE	FLAMMABLE LIMITS IN AIR	EXTINGUISHING MEDIA
N/A °F	N/A	Lower N/A % Upper	N/A

FIRE AND EXPLOSION HAZARDS
Steel products in the solid state present no fire or explosion hazard.

EXTINGUISHING MEDIA NOT TO BE USED
Do not use water on molten metal.

Reactivity

STABILITY
■ Stable ☐ Unstable

INCOMPATIBILITY (MATERIALS TO AVOID)
Reacts with strong acids to form hydrogen gas.

CONDITIONS TO AVOID: N/A

HAZARDOUS DECOMPOSITION PRODUCTS:
Metallic dust or fumes may be produced during welding, burning, grinding and possibly machining. Refer to ANSI Z49.1.

VI. ENVIRONMENTAL

SPILL OR LEAK PROCEDURES
Fine turnings and small chips should be swept or vacuumed. Scrap metal can be reclaimed for re-use.

WASTE DISPOSAL METHOD*
Used or unused product should be disposed of in accordance with Federal, State or Local Laws and Regulations.
*Disposer must comply with Federal, State and Local disposal or discharge laws.

VII. ADDITIONAL INFORMATION

In welding, precautions should be taken for airborne contaminants which may originate from components of the welding rod.

Arc or spark generated when welding or burning could be a source of ignition for combustion and flammable materials.

DISCLAIMER

The information in this MSDS was obtained from sources which we believe are reliable, however, the information is provided without any representation or warranty, expressed or implied, regarding the accuracy or correctness.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

Post signs indicating use of only nonsparking tools in area of oil storage/use.

If located indoors, the area used for oil storage should have forced-air ventilation exhausted to the outside of the building or to a baghouse or other emission control device.

Exhaust ducts should not discharge near doors, windows, or other air intakes in a manner that will permit reentry of effluents into a building.

Eye wash should be in close proximity to area where splashes could occur with visible signs indicating its location.

Post warning signs indicating area of hazardous storage and proximity restrictions/authorizations.

Main shut-off valve should be easily accessible and clearly defined.

Post sign indicating type of oil stored at entrance to storage area.

Establish written procedure for regular monitoring for oil leaks.

Physical Hazards:

-oil, petroleum: Flammable material--may be ignited by heat, sparks, or flames;

-vapors may travel to a source of ignition and flash back; and

-containers may explode in heat of fire.

Health Hazards:

-vapors may cause dizziness or suffocation; and

-fire may produce irritating or poisonous gases.

Emergency Action:

Fire/Explosion:

-Isolate area, deny employees entrance/access;

-keep individuals upwind and out of low areas; and

-for small fires use dry chemical or carbon dioxide extinguishers if such can be used from a point of safety.

Spill/Leak:

-shut off/prohibit ignition sources;

-stop leak if such can be done from a point of safety;

-use water spray to reduce vapors; and

-ventilate closed spaces.

First Aid:

-move victim to fresh air;

-call for emergency medical care;

-support victim with oxygen or artificial respiration as necessary;

-in case of frostbite, thaw frosted parts with water; and

-keep victim quiet, maintain normal body temperature.

SUBSTANCE: TIN SCRAP

MSDS NO.: 3582-23

HEALTH HAZARDS

Inhalation or ingestion of dusts or fumes generated from this material may cause eye irritation, weakness, and gastrointestinal disorders. Chronic over exposures may result in central nervous system damage, kidney damage, blood disorders, and changes in gingival tissue. This material may contain metals which have been determined to cause cancer, including lead, arsenic, and cadmium.

DANGER:MAY CONTAIN INORGANIC ARSENIC--CANCER HAZARD--HARMFUL IF INHALED OR SWALLOWED--USE ONLY WITH ADEQUATE VENTILATION OR RESPIRATORY PROTECTION.

PHYSICAL HAZARDS

Heavily concentrated dust clouds of this material may be explosive. Molten metal reacts violently with water.

PERSONAL PROTECTION

RESPIRATORY PROTECTION - for airborne dust or fume
EYE PROTECTION
GLOVES

SUPPLIER: METALS RECYCLING, INC.

ADDRESS: 89 CELIA STREET

CITY, STATE, ZIP: JOHNSTON, RI 02919

EMERGENCY TELEPHONE NO.: 401-831-7799

For More Information, Read Material Safety Data Sheet

TIN, SCRAP

GENERAL: Silvery-white to gray metal found in terneplate, babbitt metal, pewter, organ pipes, die casting, and lead pipe lining.

POTENTIAL HAZARDS:

- -Aerosolized particles
- -Explosive fine particles
- -Flammable dust
- -Hazardous fumes
- -Sharp objects/edges

PROTECTIVE EQUIPMENT:

Workers:

- -Hardhats
- -Eye/face protection
- -Safety shoes/boots
- -Gloves *(rubber when oil/solutions will be handled)*

As Needed:

- *-Respirator: air-purifying*

SAFETY PROCEDURES:

As needed, establish a written program regarding the selection and use of respirators in compliance with applicable OSHA standard.

As needed, establish a written program, including monitoring, for compliance with OSHA Standard for Inorganic Arsenic [0.01 mg/m^3 (10 μg/m^3) TWA].

As needed, establish a written program, including monitoring, for compliance with OSHA Standard for Lead [0.05 mg/m^3 (50 μg/m^3) TWA].

As needed, establish a written program, including monitoring, for compliance with OSHA Standard for Cadmium [0.005 mg/m^3 (5 μg/m^3) TWA].

2/3

As needed, establish a written program, including monitoring, to ensure that exposure to the following substances does not exceed the noted levels:

Antimony:	**0.5 mg/m³ (500 µg/m³) TWA**
Copper:	
Fumes:	**0.1 mg/m³ (100 µg/m³) TWA**
Dust/Mist:	**1 mg/m³ (1,000 µg/m³) TWA**
Silver:	**0.01 mg/m³ (10 µg/m³) TWA**
Tin:	**2 mg/m³ (2,000 µg/m³) TWA**

Eye wash should be in close proximity to tin dust producing areas, with visible signs indicating its location.

Portable fire extinguisher should be in close proximity to tin dust producing areas, with visible signs indicating its location.

Post and enforce "No Smoking" policy in area of tin dust prodcution.

For Physical Hazards, Health Hazards, and Emergency Action, consult Material Safety Data Sheet for Tin Scrap.

TERIAL SAFETY DATA SHEET

ALCOA NO. 554

Original: March 16, 1990 Supersedes: October 25, 1996 Revised: August 21, 1997

Product Name: **WROUGHT ALUMINUM PRODUCTS, 2XXX SERIES ALLOYS**

Aluminum Company of America, 425 Sixth Avenue Alcoa Building, Pittsburgh, PA 15219-1850 USA

Emergency Phone: 1-412-553-4001

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Chemical Formula: Mixture

Other Designations: 2XXX Series Alloys, C188, C231, C266, C334, C337, C346, C395, C396, C433, C434, C471, C472, CU34, Alclad 2014, Alclad 2219, Alclad 2024.
Does not include 2090, 2091, 2097, and 2195 (MSDS No. 337) or 2011 (MSDS No. 390)

Product Use: Various fabricated aluminum parts and products.

USA Phones: Chemtrec: 1-800-424-9300 or 1-703-527-3887; Health & Safety: 1-412-553-4649

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS No.	% by Weight	Form	EXPOSURE LIMITS (TWA in mg/m³) ACGIH TLV	OSHA PEL
Aluminum	7429-90-5	88.8-97.0	Total dust, fume Respirable	10, 5 —	15 5
Copper	7440-50-8	6.8 max.	Fume Dust/mist	0.2 1	0.1 1
Nickel	7440-02-0	2.3 max.	Metal	1	1
Magnesium	7439-95-4	1.9 max.	—	—	—
Manganese	7439-96-5	1.9 max.	Dust & fume	0.2	5 (ceiling)
Silicon	7440-21-3	1.4 max.	Total dust Respirable	10 —	15 5
Iron	7439-89-6	1.3 max.	—	—	—
Chromium	7440-47-3	0.2 max.	Metal	0.5	1.0
Silver	7440-22-4	0.65 max.	Metal	0.1	0.01
Lead*	7439-92-1	0.05 max.	Metal	0.05	0.05

* CU34 only

Additional compounds which may be formed during processing are listed in Section 8.

3. HAZARDS INFORMATION

EMERGENCY OVERVIEW

Solid, silvery. Odorless. Non-flammable as supplied. Small chips, fine turnings, and dust from processing may ignite readily.

Explosion/fire hazards may be present when (See Sections 5, 7 and 10 for additional information):

- Dust or fines are dispersed in the air.
- Fines or dust are in contact with other metal oxides (e.g., rust).
- Chips, fines or dust are in contact with water.
- Molten aluminum is in contact with water/moisture or other metal oxides.

Dust or fume from processing can cause eye, skin or upper respiratory tract irritation; metal fume fever; lung diseases and other systemic effects.

- **Amorphous silica** is a low health risk by inhalation. Overexposure can cause drying of the mucous membranes of the eyes, nose, and throat. Repeated exposures to dust concentrations in excess of the PEL may cause lung scarring (silicosis).
- **Alumina** is a low health risk by inhalation and should be treated as a nuisance dust as specified by the ACGIH.
- If the product is heated well above ambient temperatures or machined, **oil vapor or mist** may be generated. Overexposure to oil mist or vapor may cause asthma, bronchitis, respiratory tract irritation and neurological effects such as headaches, dizziness, drowsiness and central nervous system depression.
- Welding aluminum, plasma arc cutting, and arc spray metalizing can generate **ozone**. Overexposure to ozone can result in mucous membrane and respiratory tract irritation. Severe overexposures can cause pulmonary edema (fluid in the lungs). **Welding fumes** are listed as possibly carcinogenic to humans by IARC (Group 2B)*.
- Plasma arc cutting of aluminum can generate **oxides of nitrogen**. Oxides of nitrogen can cause irritation of the eyes, skin (when moist), and upper respiratory tract. Exposure to high levels of nitrogen oxides can cause delayed pulmonary edema (fluid in the lungs) which may be fatal. Nitric oxide can cause formation of methemoglobin which decreases the blood's ability to carry oxygen. Chronic overexposure can cause pulmonary fibrosis (scarring of the lungs).

*IARC CLASSIFICATIONS:

Group 1: The agent is carcinogenic to humans.
There is sufficient evidence that a causal relationship existed between exposure to the agent and human cancer.

Group 2A: The agent is probably carcinogenic to humans.
Generally includes agents for which there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals.

Group 2B: The agent is possibly carcinogenic to humans.
Generally includes agents for which there is limited evidence in humans in the absence of sufficient evidence in experimental animals.

Medical conditions aggravated by exposure to the product:
Chronic lung disease, skin rashes, asthma, and Wilson's disease.

4. FIRST AID MEASURES

EYES: Flush eyes with plenty of water or saline for at least 15 minutes. Consult a physician.
SKIN: Wash with soap and water for at least 15 minutes. Consult a physician if irritation persists.
INHALATION: Remove to fresh air. Check for clear airway, breathing, and presence of pulse. Provide CPR for persons without pulse or respirations. Consult a physician.

5. FIRE FIGHTING MEASURES

This product does not present fire or explosion hazards as shipped.

FLAMMABLE PROPERTIES: Non-flammable as shipped. Small chips, fine turnings, and dust from processing may ignite readily.

FIRE/EXPLOSION: May be a potential hazard under the following conditions:

- Dusts or fines dispersed in the air can be explosive.
- Chips, fines and dust in contact with water can generate flammable/explosive hydrogen gas. These gases could present an explosion hazard in confined or poorly ventilated spaces.
- Fines and dust in contact with certain metal oxides (e.g., rust). A thermite reaction, with considerable heat generation, can be initiated by a weak ignition source.
- Molten aluminum in contact with water/moisture or other metal oxides (e.g., rust). Moisture entrapped by molten aluminum can be explosive. Contact of molten aluminum with other metal oxides can initiate a thermite reaction.

EXTINGUISHING MEDIA: Use fire fighting methods and materials that are appropriate for surrounding fire. Use coarse water spray on chips or turnings. For fines, dust or molten aluminum, use Class D extinguishing agents.
DO NOT USE: Halogenated extinguishing agents on small chips/fines. Do not use water in fighting fires around molten aluminum.

FIRE FIGHTING INSTRUCTIONS: Fire fighters should wear NIOSH approved, positive pressure, self-contained breathing apparatus and full protective clothing when appropriate.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Use with adequate explosion-proof ventilation to meet exposure limits listed in Section 2.

RESPIRATORY PROTECTION: Use NIOSH-approved respiratory protection as specified by an Industrial Hygienist or other qualified professional if potential for overexposure exists.

EYE PROTECTION: Use safety glasses/goggles to avoid eye contact.

SKIN PROTECTION: Wear impervious gloves to avoid repeated or prolonged skin contact with residual oils and to avoid any skin injury.

- Sampling to establish lead level exposure is advised where exposure to airborne particulate or fumes is possible. Consult OSHA Lead Standard 29 CFR 1910.1025 for specific health/industrial hygiene precautions and requirements to follow when handling lead compounds.
- Personnel who handle and work with molten aluminum should utilize primary protective clothing like face shields, fire resistant tapper's jackets, legging spats and similar equipment to prevent burn injuries. In addition to primary protection, secondary or day-to-day work clothing that is fire resistant and sheds metal splash is recommended for use with molten aluminum.
- If coated with oil, wear oil-resistant gloves to avoid skin contact. Minimize breathing oil vapors and mist. Remove oil contaminated clothing; launder or dry-clean before reuse. Remove oil contaminated shoes and thoroughly clean and dry before reuse. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Oil coating is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

ADDITIONAL COMPOUNDS WHICH MAY BE FORMED DURING PROCESSING

			EXPOSURE LIMITS (TWA in mg/m³ unless noted)	
Compound	CAS No.	Form	ACGIH TLV	OSHA PEL
Alumina (non-fibrous)	1344-28-1	Total dust Respirable	10 —	15 5
Nickel oxide	1313-99-1	Insoluble cmpds	1 as Ni	1 as Ni
Magnesium oxide	1309-48-4	Oxide fume Total particulate	10 —	— 15 Total particulate
Manganese oxide	1317-35-7	Inorganic cmpds as Mn	0.2	5 (ceiling)
Silicon dioxide, amorphous	69012-64-2	Fume	2	—
Iron oxide	1309-37-1	Dust and fume	5 as Fe	10 (total particulate)
Chromium cmpds	—	Cr II cmpds Cr III cmpds Cr VI cmpds Cr VI cmpds	— 0.5 as Cr 0.05 as Cr * 0.01 as Cr **	0.5 as Cr 0.5 as Cr 0.1 (ceiling) as CrO_3 0.1 (ceiling) as CrO_3
Oil mist	—	Oil mist	5 ALCOA OEL: 0.5	5
Welding fumes	—	—	5	—
Nitrogen dioxide	10102-44-0	—	3 ppm, 5 ppm (STEL)	5 ppm (ceiling)
Nitric oxide	10102-43-9	—	25 ppm	25 ppm
Ozone	10028-15-6	—	0.1 ppm (ceiling)	0.1 ppm

cmpds = compounds *(water soluble) **(certain water insoluble)

See Section 3 for related health effects.

13. DISPOSAL CONSIDERATION

If reuse or recycling is not possible, material may be disposed of at an industrial landfill.

RCRA Status: Must be determined at time material is disposed. If material is disposed as waste, it must be characterized under RCRA according to 40 CFR, Part 261, or state equivalent in the U.S.

14. TRANSPORT INFORMATION

U.S.A. DOT: Not Regulated – Enter the proper freight classification, "MSDS Number," and "Product Name" on the shipping paperwork.

Canadian TDG Hazard Class & PIN: Not regulated.

15. REGULATORY INFORMATION

All electrical equipment must be suitable for use in hazardous atmospheres involving aluminum powder in accordance with 29 CFR 1910.307. The National Electrical Code, NFPA 70, contains guidelines for determining the type and design of equipment and installation which will meet this requirement.

U.S. Federal Regulations

TSCA STATUS: All components of this product are listed on the TSCA inventory.
CERCLA HAZARDOUS SUBSTANCES: Chromium, Copper, Lead, Lead compounds, Nickel, Silver.
SARA TITLE III:
Section 311/312 Physical and Health Hazard Categories: Immediate (acute), delayed (chronic) if particulates/ fumes are generated during processing. If molten: Reactive Hazard.
Section 313 Toxic Chemicals: Aluminum (fume/dust), Chromium and chromium compounds, Copper and copper compounds, Lead and lead compounds, Manganese and manganese compounds, Nickel, Silver.

State Regulations

PENNSYLVANIA "Special Hazardous Substance": Chromium compounds, hexavalent, Nickel.
CALIFORNIA PROPOSITION 65: Hexavalent chromium, Lead and Nickel are chemicals known to the State of California to cause cancer. Lead is known to the State of California to cause birth defects and other reproductive harm.

International Regulations

CANADIAN DOMESTIC SUBSTANCES LIST: All components of this product are listed on the Canadian DSL.
EUROPEAN COMMUNITY: All components of this product are listed on ECOIN, the European Core Inventory.
AUSTRALIA: All components of this product are listed on the AICS inventory.
JAPAN: With the exception of iron, all components of this product are listed on MITI, the Ministry of International Trade Industry.

16. OTHER INFORMATION

MSDS STATUS: Changes in Sections 2, 3, 5, 7, 8, 10, 11 and 15. HAZMIN® Number: 013227
PREPARED BY: Hazardous Materials Control Committee.

- Aluminum Association's Bulletin F-1, "Guidelines for Handling Aluminum Fines Generated During Various Aluminum Fabricating Operations." The Aluminum Association, 900 19th Street, N.W., Washington, DC 20006.
- NFPA 65, Standard for Processing and Finishing of Aluminum (NFPA phone: 800-344-3555)
- NFPA 651, Standard for Manufacture of Aluminum and Magnesium Powder
- NFPA 70, Standard for National Electrical Code
- NFPA 77, Standard for Static Electricity
- Aluminum Association's, "Guidelines for Handling Molten Aluminum," Aluminum Association, 900 19th Street, N.W., Washington, DC 20006.

MERIT BRASS -- BRASS PIPE FITTINGS CDA 37700 - BRASS ALLOYS
MATERIAL SAFETY DATA SHEET
NSN: 4730013554663
Manufacturer's CAGE: 9S781
Part No. Indicator: A
Part Number/Trade Name: BRASS PIPE FITTINGS CDA 37700

General Information

Item Name: BRASS ALLOYS
Company's Name: MERIT BRASS CO
Company's Street: 1 MERIT DRIVE
Company's P. O. Box: 43127
Company's City: CLEVELAND
Company's State: OH
Company's Country: US
Company's Zip Code: 44143
Company's Emerg Ph #: (216) 261-9800 OR (800) 726-9800
Company's Info Ph #: (216) 261-9800 OR (800) 726-9800
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 01MAY90
Safety Data Review Date: 22SEP92
MSDS Preparer's Name: S.R. PRESSMAN
Preparer's Company: MERIT BRASS CO
Preparer's St Or P. O. Box: 1 MERIT DRIVE
Preparer's City: CLEVELAND
Preparer's State: OH
Preparer's Zip Code: 44143
MSDS Serial Number: BNZSX

Ingredients/Identity Information

Proprietary: NO
Ingredient: COPPER (DUST & MIST), BRONZE POWDER
Ingredient Sequence Number: 01
Percent: 55-92.2
NIOSH (RTECS) Number: GL5325000
CAS Number: 7440-50-8
OSHA PEL: 0.1 MG(CU)/M3 (FUME)
ACGIH TLV: 0.2 MG/M3 (FUME)
Other Recommended Limit: 1 MG(CU)/M3 (DUST)

Proprietary: NO
Ingredient: ZINC
Ingredient Sequence Number: 02
Percent: 0.5-43%
NIOSH (RTECS) Number: ZG8600000
CAS Number: 7440-66-6
OSHA PEL: 5 MG/CUM (RESP DUST)
ACGIH TLV: 10 MG/CUM

Proprietary: NO
Ingredient: ALUMINUM (POWDER)
Ingredient Sequence Number: 03
Percent: 0-7%
NIOSH (RTECS) Number: BD0330000
CAS Number: 7429-90-5
OSHA PEL: 15 MG/CUM

ACGIH TLV: 10 MG/CUM (DUST)

Proprietary: NO
Ingredient: IRON
Ingredient Sequence Number: 04
Percent: 0.1-0.5
NIOSH (RTECS) Number: NO4565500
CAS Number: 7439-89-6
OSHA PEL: 10 MG/CUM (DUST)
ACGIH TLV: 5 MG/CUM (DUST)

Proprietary: NO
Ingredient: LEAD, INORGANIC LEAD (SUSPECTED HUMAN CARCINOGEN BY IARC, NTP & ACGIH)
Ingredient Sequence Number: 05
Percent: 0.05-4%
NIOSH (RTECS) Number: OF7525000
CAS Number: 7439-92-1
OSHA PEL: 0.05 MG/CUM
ACGIH TLV: 0.15 MG/CUM

Proprietary: NO
Ingredient: MANGANESE, MN COMPOUNDS
Ingredient Sequence Number: 06
Percent: 0-3.5%
NIOSH (RTECS) Number: OO9275000
CAS Number: 7439-96-5
OSHA PEL: (C) 5 MG/M3 DUST
ACGIH TLV: 5 MG/M3 DUST 9293

Proprietary: NO
Ingredient: NICKEL (SOLUBLE) INTENDED CHANGE (IC)
Ingredient Sequence Number: 07
Percent: 0-0.25%
NIOSH (RTECS) Number: QR5950000
CAS Number: 7440-02-0
OSHA PEL: 1 MG/CUM
ACGIH TLV: 0.05 MG/CUM IC (A1)
Other Recommended Limit: 1 MG/CUM

Proprietary: NO
Ingredient: SILICON
Ingredient Sequence Number: 08
Percent: 0-2.2%
NIOSH (RTECS) Number: VW0400000
CAS Number: 7440-21-3
OSHA PEL: 15 MG/M3 TDUST
ACGIH TLV: 10 MG/M3 TDUST; 9293

Proprietary: NO
Ingredient: TIN (AS SN)
Ingredient Sequence Number: 09
Percent: 0-1%
NIOSH (RTECS) Number: XP7320000
CAS Number: 7440-31-5
OSHA PEL: 2.0 MG/CUM
ACGIH TLV: 2.0 MG/CUM

Physical/Chemical Characteristics

Appearance And Odor: BRASS IS A SHINY YELLOW-GOLDEN COLORED METALLIC SOLID, NO ODOR.
Melting Point: 1500-2100F
Specific Gravity: 7.5-9
Solubility In Water: INSOLUBLE

Fire and Explosion Hazard Data

Extinguishing Media: WATER SPRAY OR ABC DRY CHEMICAL
Special Fire Fighting Proc: DON'T USE WATER ON MOLTEN METAL. NO PROCEDURES NEEDED WHEN A SOLID.
Unusual Fire And Expl Hazrds: PLACING WET BRASS PARTS INTO A MELTING FURNACE WOULD BE AN EXPLOSION HAZARD.

Reactivity Data

Stability: YES
Materials To Avoid: STRONG ACIDS OR BASES
Hazardous Decomp Products: FLAMMABLE OR TOXIC GASES
Hazardous Poly Occur: NO

Health Hazard Data

Route Of Entry - Inhalation: YES
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: SKIN: DISCOLORATION. INHALATION: COLD-LIKE SYMPTOMS OF METAL FUME FEVER, METALLIC TASTE IN MOUTH, CHILLS, FEVER, DRY MOUTH & THROAT, & HEADACHE.
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NICKEL IS AN A1 CARCINOGEN & LEAD IS A SUSPECTED HUMAN CARCINOGEN BY ACGIH.
Signs/Symptoms Of Overexp: SKIN: DISCOLORATION. INHALATION: COLD-LIKE SYMPTOMS OF METAL FUME FEVER, METALLIC TASTE IN MOUTH, CHILLS, FEVER, DRY MOUTH & THROAT, & HEADACHE.
Emergency/First Aid Proc: INHALATION: REMOVE TO FRESH AIR. EYES: FLUSH W/CLEAN WATER FOR 30 MINS. SKIN: WASH THOROUGHLY W/SOAP & WATER. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: BRASS PARTS SPILLS SHOULD CONSTITUTE ONLY A TRIP & FALL HAZARD.
Waste Disposal Method: BRASS METAL IS VALUABLE & MAY BE RECYCLED BY FOUNDRIES & SECONDARY METAL SMELTERS. AVOID MELTING BRASS CHIPS COVERED W/ METAL CUTTING OIL SINCE THIS WILL CAUSE FUGATIVE EMMISSIONS OF DENSE SMOKE INTO THE AIR.
Precautions-Handling/Storing: DON'T USE BRASS PIPE & FITTINGS TO TRANSPORT CORROSIVE LIQUIDS. COPPER FUMES MAY CAUSE THE DISCOLORATION OF SKIN & HAIR.
Other Precautions: PROTECT BRASS PARTS FROM MOISTURE TO AVOID DISCOLORATION & CORROSION. NEVER PLACE WET BRASS PARTS INTO A MELTING FURNACE.

Control Measures

Respiratory Protection: USE A NIOSH APPROVED HEPA RESPIRATOR WHEN MELTING, BRAZING, OR GRINDING BRASS METAL.
Ventilation: LOCAL EXHAUSTS: RECOMMENDED WHEN MELTING, BRAZING, OR

GRINDING BRASS METAL.
Protective Gloves: COTTON WORK, CUT-RESISTANT
Eye Protection: APPROPRIATE PROTECTION
Other Protective Equipment: CLOTHING APPROPRIATE TO THE FABRICATION OPERATION ATTEMPTED W/THIS PRODUCT.
Work Hygienic Practices: THOROUGHLY SHOWER & CHANGE CLOTHES. WASH HANDS BEFORE EATING.

Transportation Data

Disposal Data

Label Data

Label Required: NO
Technical Review Date: 22SEP92
Label Date: 06AUG92
Label Status: N
Special Hazard Precautions: CARCINOGENS: NICKEL (A1)
Label Name: MERIT BRASS CO
Label Street: 1 MERIT DRIVE
Label P.O. Box: 43127
Label City: CLEVELAND
Label State: OH
Label Zip Code: 44143
Label Country: US
Label Emergency Number: (216) 261-9800 OR (800) 726-9800

MEIER METAL SERVICENTERS INC -- COPPER/COPPER ALLOYS

MSDS Safety Information

FSC: 5330
NIIN: 01-371-4631
MSDS Date: 05/17/1993
MSDS Num: CKWFG
Product ID: COPPER/COPPER ALLOYS
MFN: 01
Article: Y
Responsible Party
Cage: 1L214
Name: MEIER METAL SERVICENTERS INC
Address: 1471 EAST NINE MILE RD
City: HAZEL PARK MI 48030-1960
Info Phone Number: 248-398-1900
Emergency Phone Number: (248)398-1900
Review Ind: Y
Published: Y

Contractor Summary

Cage: 2N335
Name: ABSCOA INDUSTRIES INC
Address: 2000 ROBOTICS PL
Box: 185369
City: FT WORTH TX 76118
Phone: 817-284-4449
Contract Number: DLA500-93-M-JA12
Cage: 1L214
Name: MEIER METAL SERVICENTERS INC
Address: 1471 E NINE MILE RD
City: HAZEL PARK MI 48030-1960

Item Description Information

Item Manager: S9I
Item Name: GASKET
Unit of Issue: EA
Type of Container: EACH

Ingredients

Cas: 7429-90-5
RTECS #: BD0330000
Name: ALUMINUM
OSHA PEL: 15 MG/M3
ACGIH TLV: 10 MG/M3
ACGIH STEL: NOT ESTABLISHED

Cas: 7440-36-0
RTECS #: CC4025000
Name: ANTIMONY
OSHA PEL: 0.5 MG/M3
ACGIH TLV: 0.5 MG/M3
ACGIH STEL: NOT ESTABLISHED
EPA Rpt Qty: 5000 LBS
DOT Rpt Qty: 5000 LBS

Cas: 7440-38-2
RTECS #: CG0525000
Name: ARSENIC
ACGIH TLV: 0.01 MG/M3
ACGIH STEL: NOT ESTABLISHED
EPA Rpt Qty: 1 LB
DOT Rpt Qty: 1 LB

Cas: 7440-41-7
RTECS #: DS1750000
Name: BERYLLIUM
OSHA PEL: SEE TABLE Z-2
ACGIH TLV: 0.002 MG/M3
ACGIH STEL: NOT ESTABLISHED
EPA Rpt Qty: 10 LBS
DOT Rpt Qty: 10 LBS

Cas: 1304-82-1
RTECS #: EB3110000
Name: BISMUTH TELLURIDE
OSHA PEL: 15 MG/M3

Cas: 1303-86-2
RTECS #: ED7900000
Name: BORON OXIDE
OSHA PEL: 15 MG/M3
ACGIH TLV: 10 MG/M3
ACGIH STEL: NOT ESTABLISHED

Cas: 7440-43-9
RTECS #: EU9800000
Name: CADMIUM
OSHA PEL: SEE 1910.1027
EPA Rpt Qty: 10 LBS
DOT Rpt Qty: 10 LBS

Cas: 1333-86-4
RTECS #: FF5800000
Name: CARBON BLACK
OSHA PEL: 3.5 MG/M3
ACGIH TLV: 3.5 MG/M3
ACGIH STEL: NOT ESTABLISHED

Cas: 7440-47-3
RTECS #: GB4200000
Name: CHROMIUM
OSHA PEL: 1 MG/M3
ACGIH TLV: 0.5 MG/M3
ACGIH STEL: NOT ESTABLISHED
EPA Rpt Qty: 1 LB
DOT Rpt Qty: 1 LB

Cas: 7440-48-4
RTECS #: GF8750000
Name: COBALT
OSHA PEL: 0.1 MG/M3
ACGIH TLV: 0.02 MG/M3
ACGIH STEL: NOT ESTABLISHED

Cas: 7440-50-8

RTECS #: GL5325000
Name: COPPER
OSHA PEL: 1 MG/M3
ACGIH TLV: 1 MG/M3
ACGIH STEL: NOT ESTABLISHED
EPA Rpt Qty: 5000 LBS
DOT Rpt Qty: 5000 LBS

Cas: 7439-89-6
RTECS #: NO4565500
Name: IRON

Cas: 7439-92-1
RTECS #: OF7525000
Name: LEAD
ACGIH TLV: 0.15 MG/M3
ACGIH STEL: NOT ESTABLISHED
EPA Rpt Qty: 1 LB
DOT Rpt Qty: 1 LB

Cas: 7580-67-8
RTECS #: OJ6300000
Name: LITHIUM HYDRIDE
OSHA PEL: 0.025 MG/M3
ACGIH TLV: 0.025 MG/M3
ACGIH STEL: NOT ESTABLISHED

Cas: 7439-96-5
RTECS #: OO9275000
Name: MANGANESE
OSHA PEL: C5 MG/M3
ACGIH TLV: 5 MG/M3
ACGIH STEL: NOT ESTABLISHED

Cas: 1309-48-4
RTECS #: OM3850000
Name: MAGNESIUM OXIDE
OSHA PEL: 15 MG/M3
ACGIH TLV: 10 MG/M3
ACGIH STEL: NOT ESTABLISHED

Cas: 7440-02-0
RTECS #: QR5950000
Name: NICKEL
OSHA PEL: 1 MG/M3
ACGIH TLV: 1 MG/M3
ACGIH STEL: NOT ESTABLISHED
EPA Rpt Qty: 100 LBS
DOT Rpt Qty: 100 LBS

Cas: 7723-14-0
RTECS #: TH3495000
Name: PHOSPHORUS
OSHA PEL: 0.1 MG/M3
ACGIH TLV: 0.1 MG/M3;0.02 PPM
ACGIH STEL: NOT ESTABLISHED
EPA Rpt Qty: 1 LB
DOT Rpt Qty: 1 LB

Cas: 7782-49-2

RTECS #: VS7700000
Name: SELENIUM
ACGIH TLV: NOT ESTABLISHED
ACGIH STEL: 0.2 PPM
EPA Rpt Qty: 1 LB
DOT Rpt Qty: 1 LB

Cas: 7440-21-3
RTECS #: VW0400000
Name: SILICON
OSHA PEL: 15 MG/M3
ACGIH TLV: 10 MG/M3
ACGIH STEL: NOT ESTABLISHED

Cas: 7440-22-4
RTECS #: VW3500000
Name: SILVER
OSHA PEL: 0.01 MG/M3
ACGIH TLV: 0.1 MG/M3
ACGIH STEL: NOT ESTABLISHED
EPA Rpt Qty: 1 LB
DOT Rpt Qty: 1 LB

Cas: 7446-09-5
RTECS #: WS4550000
Name: SULPHUR DIOXIDE
OSHA PEL: 13 MG/M3;5 PPM
ACGIH TLV: 5.2 MG/M3;2 PPM
ACGIH STEL: 13 MG/M3;5 PPM

Cas: 13494-80-9
RTECS #: WY2625000
Name: TELLURIUM
OSHA PEL: 0.1 MG/M3
ACGIH TLV: 0.1 MG/M3
ACGIH STEL: NOT ESTABLISHED

Cas: 7440-31-5
RTECS #: XP7320000
Name: TIN
ACGIH TLV: 2 MG/M3
ACGIH STEL: NOT ESTABLISHED

Cas: 13463-67-7
RTECS #: XR2275000
Name: TITANIUM DIOXIDE
OSHA PEL: 15 MG/M3
ACGIH TLV: 10 MG/M3
ACGIH STEL: NOT ESTABLISHED

Cas: 7440-66-6
RTECS #: ZG8600000
Name: ZINC
EPA Rpt Qty: 1000 LBS
DOT Rpt Qty: 1000 LBS

Cas: 7440-67-7
RTECS #: ZH7070000
Name: ZIRCONIUM
ACGIH TLV: 5 MG/M3

ACGIH STEL: 10 MG/M3

Health Hazards Data

Route Of Entry Inds - Inhalation: YES
Skin: YES
Ingestion: YES
IARC: YES
Effects of Exposure: UNDER NORMAL HANDLING CONDITIONS THE SOLID ALLOY PRESENTS NO SIGNIFICANT HEALTH HAZARDS. PROCESSING OF THE ALLOY BY DUST OR FUME PRODUCING OPERATION (GRINDING, BUFFING, HEATING, WELDING, ETC) MAY RESULT IN THE POTENTIAL FOR EXPOSURE TO AIRB ORNE METAL PARTICULATES OR FUME. (FOR ACUTE/CHRONIC/SYMPTOMS BY INGREDIENT PER MSDS, CALL EITHER THE MANUFACTURER FOR AN ORIGINAL MSDS OR CALL DLA- AT 804-279-4371)
Explanation Of Carcinogenicity: ANTIMONY TRIOXIDE, BERYLLIUM, CADMIUM, CHROMIUM (IARC), COBALT-CHROMIUM ALLOY, LEAD AND NICKEL HAVE BEEN IDENTIFIED AS POTENTIAL HUMAN CARCINOGENS.
Signs And Symptions Of Overexposure: POSSIBLE SYMPTOMS FROM EXPOSURE TO THE VARIOUS CONSTIUENTS OF THE ALLOY: METALLIC TATSE, VOMITING, COLIC, LOSS OF APPETITE/WEIGHT,DIARRHEA, DERMATITIS, GRANULOMATOUS LESIONS ON SKIN/LIVER/KIDNEYS/SPLEEN/LYMPH NODES, NON-PRODUCTIVE COUGH, DI FFICULTY BREATHING, SORE/DRY THROAT, CHEST PAIN, HEADACHE, DIZZINESS, UPPER RESPIRATORY TRACT IRRITATION, METAL FUME FEVER(CHILLS, FEVER, COUGH, STOMACH PAIN, HEADACHE, NAUSEA, VOMITING, METALLIC TASTE, PAINS IN MUSCLES/JOINTS).
Medical Cond Aggravated By Exposure: PREGNANCY, RESPIRATORY INFECTION, THYROTOXICOSIS.
First Aid: EYE: FLUSH WELL WITH RUNNING WATER TO REMOVE PARTICULATE. GET MEDICAL ATTENTION. SKIN: VACUUM OFF EXCESS DUST. WASH WELL WITH SOAP AND WATER. INHALATION: REMOVE TO FRESH AIR. GET MEDICAL ATTENTION. INGESTION: SEEK MEDICAL ATTENTION IF LARG E QUANTITIES OF MATERIAL HAVE BEEN INGESTED.

Handling and Disposal

Spill Release Procedures: NO SPECIAL PRECAUTIONS ARE NECESSARY FOR SPILLS OF BULK MATERIAL. IF LARGE QUANTITIES OF DUST ARE SPILLED, REMOVE BY VACUUMING OR WET SWEEPING TO PREVENT HEAVY CONCENTRATION OF AIRBORNE DUST. FOLLOW FEDERAL, STATE, AND LOCAL REGULATIONS.
Neutralizing Agent: NO DATA PROVIDED BY MANUFACTURER
Waste Disposal Methods: DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. CLEANUP PERSONNEL SHOULD WEAR RESPIRATORS AND PROTECTIVE CLOTHING. VENTILATE AREA OF RELEASE.
Handling And Storage Precautions: STORE MATERIAL AWAY FROM INCOMPATIBLE MATERIALS AND KEEP DUST FROM SOURCES OF IGNITION.
Other Precautions: NO DATA PROVIDED BY MANUFACTURER

Fire and Explosion Hazard Information

Extinguishing Media: SOLID MASSIVE FORM IS NOT COMBUSTIBLE. USE SPECIAL MIXTURES OF DRY CHEMICAL OR SAND.
Fire Fighting Procedures: FIREFIGHTERS SHOULD WEAR NIOSH/MSHA SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING. MOLTEN METAL MAY REACT VIOLENTLY WITH WATER:
Unusual Fire/Explosion Hazard: FIRE AND EXPLOSION HAZARDS ARE MODERATE WHEN MATERIAL IS IN THE FORM OF DUST AND EXPOSED TO HEAT, FLAMES, CHEMICAL REACTION, OR IN CONTACT WITH POWERFUL OXIDIZERS.

Control Measures

Respiratory Protection: IF EXPOSURE ABOVE THE PEL OR TLV, NIOSH/MSH APPROVED RESPIRATOR FOR FUME OR DUST, DEPENDENT UPON THE SOURCE OF AIRBORNE

CONTAMINANT.
Ventilation: REQUIRED IF DUST OR FUME CREATED IN HANDLING OR WORKING ON THIS MATERIAL & THRESHOLD LIMITS ARE BEING APPROACHED. MECHANICAL(GENERAL):ABOVE TO REDUCE AIRBORNE
Protective Gloves: SELECT GLOVES APPROVED FOR THE SPECIFIED OPERATION.
Eye Protection: MINIMUM REQUIREMENT OF SAFETY GLASSES WITH SIDE SHIELDS FOR THOSE OPERATIONS.
Other Protective Equipment: PROTECTIVE GLOVES AND EYE PROTECTION: REQUIRED FOR MELT, GRIND, CUT OR WELD OPERATIONS. OTHER PROTECTIVE CLOTHING OR EQUIPMENT AS REQUIRED FOR THE WORK DONE ON OR WITH THE METAL.
Work Hygienic Practices: AS REQUIRED FOR THE WORK DONE WITH LEAD BEARING MATERIALS. MEET REQUIREMENTS OF THE OSHA LEAD STANDARD WHERE NECESSARY. ALWAYS EVALUATE THE JOBS DONE ON THIS PRODUCT I/A/W OSHA/STATE REGULATIONS.
Supplemental Safety and Health: NO DATA PROVIDED BY MANUFACTURER. DLA- STAFF NOTE: THIS MSDS REPRESENTS THE METALLIC OUTER SHELL OF A COMPOSITE GASKET. THE INNER FILLING IS REPRESENTED BY RECORD, SERIAL NUMBER: CKWFB.

Physical/Chemical Properties

HCC: N1
M.P/F.P Text: APPROX. 1290-2260F
Spec Gravity: 7.45-9.00
Solubility in Water: INSOLUBLE
Appearance and Odor: SILVER TO YELLOW TO RED SOLID; NO ODOR.

Reactivity Data

Stability Indicator: YES
Stability Condition To Avoid: STABLE UNDER NORMAL CONDITONS OF TRANSPORT AND STORAGE. MOLTEN METAL MAY REACT VIOLENTLY WITH WATER.
Materials To Avoid: ACIDS, BASES, AND OXIDIZERS.
Hazardous Decomposition Products: METAL FUME.
Hazardous Polymerization Indicator: NO
Conditions To Avoid Polymerization: WILL NOT OCCUR.

Toxicological Information

Toxicological Information: NO DATA PROVIDED BY MANUFACTURER

Ecological Information

Ecological: NO DATA PROVIDED BY MANUFACTURER

MSDS Transport Information

Transport Information: NO DATA PROVIDED BY MANUFACTURER

Regulatory Information

Sara Title III Information: THE FOLLOWING INGREDIENTS ARE TOXIC CHEMICALS SUBJECT TO REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF S.A.R.A. OF 1986 AND CFR 372: ALUMINUM, ARSENIC, BERYLLIUM, CADMIUM, CHROMIUM, COBALT, COPPER, LEAD, MANGANESE, NICKEL, SILVER, S ULPHUR DIOXIDE, TELLURIUM, ZINC.
Federal Regulatory Information: NO DATA PROVIDED BY MANUFACTURER
State Regulatory Information: NO DATA PROVIDED BY MANUFACTURER

Other Information

Other Information: MANUFACTURER STATES "SEE ATTACHED ALLOY COMPOSITION SHEETS FOR ALLOY PRESENCE AND PERCENTAGES OF ALLOYING INGREDIENTS"; HOWEVER, NO

SHEET WAS ATTACHED TO MSDS. VENDOR UNABLE TO PROVIDE AND DUE TO AGE OF CONTRACT DLA- UNABLE TO ASCERTAI N SUCH FROM THAT. ADDITIONALLY, CID & MIL-SPEC DO NOT DEFINE THE ALLOY REQUIRED.

Transportation Information

Responsible Party Cage: 1L214
Trans ID NO: 155413
Product ID: COPPER/COPPER ALLOYS
MSDS Prepared Date: 05/17/1993
Review Date: 11/22/2000
MFN: 1
Net Unit Weight: UNKNOWN
Multiple KIT Number: 0
Unit Of Issue: EA
Type Of Container: EACH

Detail DOT Information

DOT PSN Code: ZZZ
DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

Detail IMO Information

IMO PSN Code: ZZZ
IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION

Detail IATA Information

IATA PSN Code: ZZZ
IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

Detail AFI Information

AFI PSN Code: ZZZ
AFI Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

HAZCOM Label

Product ID: COPPER/COPPER ALLOYS
Cage: 1L214
Company Name: MEIER METAL SERVICENTERS INC
Street: 1471 E NINE MILE RD
City: HAZEL PARK MI
Zipcode: 48030-1960
Health Emergency Phone: (248)398-1900
Date Of Label Review: 11/22/2000
Status Code: A
Year Procured: 1993
Origination Code: F
Chronic Hazard IND: Y
Eye Protection IND: NO
Skin Protection IND: NO
Signal Word: NONE
Respiratory Protection IND: NO
Health Hazard: None
Contact Hazard: None
Fire Hazard: None
Reactivity Hazard: None
Hazard And Precautions: UNDER NORMAL HANDLING CONDITIONS THE SOLID ALLOY

PRESENTS NO SIGNIFICANT HEALTH HAZARDS. PROCESSING OF THE ALLOY BY DUST OR FUME PRODUCING OPERATION (GRINDING, BUFFING, HEATING, WELDING, ETC) MAY RESULT IN THE POTENTIAL FOR EXPOSURE TO AIRB ORNE METAL PARTICULATES OR FUME. TARGET ORGANS: N/P.

Disclaimer (provided with this information by the compiling agencies): This information is formulated for use by elements of the Department of Defense. The United States of America in no manner whatsoever expressly or implied warrants, states, or intends said information to have any application, use or viability by or to any person or persons outside the Department of Defense nor any person or persons contracting with any instrumentality of the United States of America and disclaims all liability for such use. Any person utilizing this instruction who is not a military or civilian employee of the United States of America should seek competent professional advice to verify and assume responsibility for the suitability of this information to their particular situation regardless of similarity to a corresponding Department of Defense or other government situation.

TRENTON PIPE NIPPLE COMPANY
TRADENAME OF GA PIPE, INC.

3000 Cabot Boulevard, West • Suite 300 • Langhorne, PA 19047
Tel. (215) 891-9000 • (800) 257-9559 • Fax. (215) 891-9009

1700 Industrial Park Road • PO Box 40 • Federalsburg, MD 21632
Tel. (410) 754-5067 • Fax (410) 754-8131

MATERIAL SAFETY DATA SHEET

PRODUCT IDENTITY: Yellow Brass Pipe

SECTION I - PRODUCT INFORMATION

PRODUCT NAME:	Yellow Brass	MANUFACTURE'S NAME:
CHEMICAL NAME:	Copper-Zinc alloy, ASTM UNS C26000	Various
CHEMICAL FAMILY:	Copper alloy	
TDG NAME:	N.A.	DISTRIBUTOR:
PHYSICAL DESCRIPTION:	Yellow colored metallic solid No odor and not soluable	Trenton Pipe Nipple Company

SECTION II - HAZARDOUS INGREDIENTS

ELEMENT	CAS NO.	% RANGE	OSHA PEL (mg/M³)	ACGIH TLV (mg/M³)
Copper	7440-50-8	68.5 - 71.5	0.1 fume, 1 dust	0.2 fume, 1 dust
Zinc	7440-66-6	28.5 - 31.5	5 respirable dust, 15 total dust	5 respirable dust, 10 total dust

SECTION III - PHYSICAL DATA

MELTING POINT: 1025°C or 1880°F

DENSITY: 8.75 gr/cm³

BOILING POINT: Not Applicable

VAPOR PRESSURE: Not Applicable

SOLUBILITY: Insoluble

VAPOR DENSITY: Not Applicable

SECTION IV - FIRE & EXPLOSION HAZARDS

FLAMMABILITY:	NO
EXPLOSIVITY:	NO
Lower %	N.A.
Upper %	N.A.
FLASHPOINT:	N.A.

Means of Extinguishing:
None, not flammable.

Special Fire Fighting:
None when solid.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Do not use water on molten metal. Finely divided dust is flammable.

MATERIAL SAFETY DATA SHEET (continuation):

SECTION V - TOXICOLOGY & FIRST AID	Yellow Brass Pipe

EFFECTS OF OVEREXPOSURE: No adverse health effects when handling intact parts; wash hands before eating to prevent ingestion of minute amounts of toxic metal that may accumulate in the body.

INHALATION:	Dust may irritate nose and throat. If heated, copper and zinc fumes may cause metal fume fever, a delayed benign transient flu-like condition.
FIRST AID:	Remove from exposure to fresh air, thoroughly shower and change clothing.
INGESTION:	Rare in industry. Dust may irritate mouth and gastrointestinal tract.
FIRST AID:	Induce vomiting and seek medical assistances.
EYES:	Flush with clean water for thirty minutes.
SKIN:	Wash thoroughly with soap and water.

SECTION VI - REACTIVITY DATA

STABILITY: Yellow brass metal is stable at room temperature
CONDITIONS TO AVOID: Reacts violently with hydrogen peroxide.
HAZARDOUS DECOMPOSITION PRODUCTS: Does not decompose. Reaction with acids could produce noxious gases. In contact with acids, hydrogen gas may evolve.
POLYMERIZATION: Will not occur.
INCOMPATIBILITY: Copper reacts violently with acetylene, ammonium nitrate, bromates, chlorates, iodates. Copper foil burns spontaneously in gaseous chlorine. Avoid contact with chlorine and oxygen difluoride, ethylene oxide, fluorine, hydrogen peroxide, hydrazine monoitrate, hydrazoic acid. Incompatible with hydrogen sulfide, lead azide, potassium peroxide.

SECTION VII - PREVENTIVE MEASURES

VENTILATION:	Local exhaust ventilation is recommended when melting, brazing or grinding brass metal.
RESPIRATORY:	Wear appropriate NIOSH-MSHA approved respirators whenever workplace contamination exceeds applicable limits.
EYE PROTECTION:	Wear appropriate eye protection when melting, brazing, soldering, cutting or grinding brass metal.
HANDLING:	Do not eat or drink when handling this material. Use cotton work gloves to prevent transfer of metal to skin.
STORAGE:	Store away from corrosive chemicals such as acids.
SPILLS:	Solid metal does not pose any problems. Dust spills should be cleaned up avoiding dust generation. Collect and recycle to process. Wash down with water if in contact with acids.
DISPOSAL:	Recycle or dispose of material in accordance with government regulations.

ALCOA

Material Safety Data Sheet

Product Name: WROUGHT ALUMINUM PRODUCTS, 6xxx SERIES ALLOYS ID: 668

*** Section 1 - Chemical Product and Company Identification ***

Chemical Formula: Mixture
Product Use: Various fabricated aluminum parts and products.
Other Designations: 6xxx Series Alloys, 6005A, Alclad 6061, C58, C04A, C32A, C39A, C43A (HS54), C45A, C57A, C66A, C74A, C79A, C86A, C87A, C90A, C93A, C02B, C03B, C12B, C13B, C34B, C36B, C38B, C39B, C40B, C41B, C42B, C44B, C45B, C57B, C90B, C95B, C19C, C23C, C38C, C92C, C04D, C54D, C55D, C79D, C09E, C33E, C34E, C45E, C90E, C95E, C40H, C41H, C53H, C54H, C57H, C59H, C73H, C74H, C13J, C14J, C24J, C52M, C210, C211, C243, C291, C327, C333, C336, C366, C420, C422, C444, C461, C450, C456, C481, C512, C711, C725, C733, C735, C739, C747, C750, C755, C757, C758, C761, C762, C766, C767, C769, C989, CB90, CE93, CR30, CU74, CZ19, CZ26, KB12, KB13, KB15, KB16, KB18, KB19, KB20, KB22, KB25, K661, MB376, MC61, MD64, MD244, MD248, MD267, MD265, MD284, MD290, MD293, MD294, MD326, MD337, MD342, MD343, MD344, MD361, PC61, PT61, RA35, RA271, Semi 6

Does not include Alloy 6262 (MSDS No. 390) and does not include Alloy 6020 (MSDS No. 723)

Alcoa Inc.
201 Isabella Street
Pittsburgh, PA 15212-5858

Phone: Health and Safety: 1-412-553-4649

Emergency Information: USA: Chemtrec: 1-800-424-9300 or 1-703-527-3887 Alcoa: 1-412-553-4001
Website: For a current MSDS, refer to Alcoa websites: www.alcoa.com or internally at my.alcoa.com EHS Community

*** Section 2 - Hazards Identification ***

EMERGENCY OVERVIEW

Solid. Silvery. Odorless. Non-combustible as supplied. Small chips, fine turnings and dust from processing may be readily ignitable.

Explosion/fire hazards may be present when (See Sections 5, 7 and 10 for additional information):
* Dust or fines are dispersed in the air.
* Chips, dust or fines are in contact with water.
* Dust or fines are in contact with certain metal oxides (e.g. rust).
* Molten metal is in contact with water/moisture or certain metal oxides (e.g. rust).

Dust and fume from processing can cause irritation of eyes, skin and upper respiratory tract and metal fume fever.

POTENTIAL HEALTH EFFECTS

The following statements summarize the health effects generally expected in cases of overexposures. User specific situations should be assessed by a qualified individual. Additional health information can be found in Section 11.

The health effects listed below are not likely to occur unless processing of this product generates dust or fumes.

Eyes

Dust or fume from processing: Can cause irritation.

Skin

Contact with residual oil/oil coating: Can cause irritation. Prolonged or repeated contact with the skin can cause dermatitis.
Dust or fume from processing: Can cause sensitization and allergic contact dermatitis.

Inhalation

Health effects from mechanical processing (e.g., cutting, grinding): Can cause irritation of respiratory tract. **Chronic overexposures:** Can cause reduction in the number of red blood cells (anemia), skin abnormalities (pigmentation changes), scarring of the lungs (pulmonary fibrosis), benign lung disease (stannosis), central nervous system damage, secondary Parkinson's disease and reproductive harm.
Additional health effects from elevated temperature processing (e.g., welding, melting): **Acute overexposures:** Can cause nausea, fever, chills, shortness of breath and malaise (metal fume fever) and reduced ability of the blood to carry oxygen (methemaglobin). **Chronic overexposures:** Can cause respiratory sensitization and lung cancer.

Carcinogenicity and Reproductive Hazard

Product as shipped: Does not present any cancer or reproductive hazards.
Dust and fumes from mechanical processing: Can present a cancer hazard (nickel, lead). Can present a reproductive hazard (manganese, lead).
Dust and fumes from welding or elevated temperature processing: Can present a cancer hazard (hexavalent chromium, lead compounds, nickel compounds, welding fumes). Can present a reproductive hazard (manganese, lead).

Medical Conditions Aggravated By Exposure to Product, Components or Compounds Formed During Processing

Dust or fume from processing: Asthma, chronic lung disease, skin rashes and secondary Parkinson's disease.

*** Section 3 - Composition / Information on Ingredients ***

Complete composition is provided below and may include some components classified as non-hazardous.

CAS #	Component	Percent
7429-90-5	Aluminum	>89.9
7440-66-6	Zinc	<2.5
7439-95-4	Magnesium	<2.1
7440-21-3	Silicon	<1.8
7439-96-5	Manganese	<1.5
7440-50-8	Copper	<1.3
7439-89-6	Iron	<1.1
7440-31-5	Tin*	<0.9
7440-47-3	Chromium	<0.5
7440-02-0	Nickel	0-0.30
7439-92-1	Lead**	0-0.05

Component Information

* Alloy C711 only. **Alloys C04A, C06A, C12B, C13B, C34B, C36B, C44B, C54H.
Additional compounds which may be formed during processing are listed in Section 6.

*** Section 4 - First Aid Measures ***

First Aid: Eyes

Dust or fume from processing: Flush eyes with plenty of water or saline for at least 15 minutes. Consult a physician.

First Aid: Skin

Dust or fume from processing or contact with lubricant/residual oil: Wash skin with soap and water for at least 15 minutes. Consult a physician if irritation persists.

First Aid: Inhalation

Dust or fume from processing: Remove to fresh air. If unconscious or severely injured, check for clear airway, breathing and presence of pulse. Perform CPR if there is no pulse or respiration. Consult a physician.

*** Section 5 - Fire Fighting Measures ***

Flammable/Combustible Properties

This product does not present fire or explosion hazards as shipped. Small chips, turnings, dust and fines from processing may be readily ignitable.

Fire/Explosion

May be a potential hazard under the following conditions:

* Dust or fines dispersed in the air can be explosive. Even a minor dust cloud can explode violently. Dust accumulation on the floor, ledges and beams can present a risk of ignition, flame propagation and secondary explosions.
* Chips, dust or fines in contact with water can generate flammable/explosive hydrogen gas. Hydrogen gas could present an explosion hazard in confined or poorly ventilated spaces.
* Dust or fines in contact with certain metal oxides (e.g., rust). A thermite reaction, with considerable heat generation, can be initiated by a weak ignition source.
* Molten metal in contact with water/moisture or other metal oxides (e.g., rust, copper oxide). Moisture entrapped by molten metal can be explosive. Contact of molten aluminum with other metal oxides can initiate a thermite reaction. Finely divided metals (e.g., powders or wire) may have enough surface oxide to produce thermite reactions/explosions.

Extinguishing Media

Use Class D extinguishing agents on dusts, fines or molten metal. Use coarse water spray on chips and turnings.

Unsuitable Extinguishing Media

DO NOT USE:

* Halogenated agents on small chips, dusts or fines.
* Water around molten metal.

These agents will react with the burning material.

Fire Fighting Equipment/Instructions

Fire fighters should wear NIOSH approved, positive pressure, self-contained breathing apparatus and full protective clothing when appropriate.

*** Section 6 - Accidental Release Measures ***

Small/Large Spill

If molten: Contain the flow using dry sand or salt flux as a dam. Do not use shovels or hand tools to halt the flow of molten aluminum. Allow the spill to cool before remelting as scrap.

*** Section 7 - Handling and Storage ***

Handling/Storage

Product should be kept dry. Avoid generating dust. Avoid contact with sharp edges or heated metal. Hot and cold aluminum are not visually different. Hot aluminum does not necessarily glow red.

Requirements for Processes Which Generate Dusts or Fumes

If processing of these products includes operations where dust or extremely fine particulate is generated, obtain and follow the safety procedures and equipment guides contained in Aluminum Association Bulletin F-1 and National Fire Protection Association (NFPA) brochures listed in Section 16. Cover and reseal partially empty containers. Use non-sparking handling equipment. Provide grounding and bonding where necessary to prevent accumulation of static charges during dust handling and transfer operations. (See Section 15).

Local ventilation and vacuum systems must be designed to handle explosive dusts. Dry vacuums and electrostatic precipitators must not be used. Dust collection systems must be dedicated to aluminum dust only and should be clearly labeled as such. Do not co-mingle fines of aluminum with fines of iron, iron oxide (rust) or other metal oxides.

Do not allow chips, fines or dust to contact water, particularly in enclosed areas.

Avoid all ignition sources. Good housekeeping practices must be maintained. Do not use compressed air to remove settled material from floors, beams or equipment.

Requirements for Remelting of Scrap Material and/or Ingot

Molten metal and water can be an explosive combination. The risk is greatest when there is sufficient molten metal to entrap or seal off the water. Water and other forms of contamination on or contained in scrap or remelt ingot are known to have caused explosions in melting operations. While the products may have minimal surface roughness and internal voids, there remains the possibility of moisture contamination or entrapment. If confined, even a few drops of water can lead to violent explosions.

All tooling and containers which come in contact with molten metal must be preheated or specially coated and rust free. Molds and ladles must be preheated or oiled prior to casting. Any surfaces that may contact molten metal (e.g., concrete) should be specially coated.

Drops of molten metal in water (e.g. from plasma arc cutting), while not normally an explosion hazard, can generate enough flammable hydrogen gas to present an explosion hazard. Vigorous circulation of the water and removal of the particles minimize the hazards.

During melting operations, the following minimum guidelines should be observed:
* Inspect all materials prior to furnace charging and completely remove surface contamination such as water, ice, snow, deposits of grease and oil or other surface contamination resulting from weather exposure, shipment, or storage.
* Store materials in dry, heated areas with any cracks or cavities pointed downwards.
* Preheat and dry large or heavy items such as ingot adequately before charging into a furnace containing molten metal. This is typically done by use of a drying oven or homogenizing furnace. The drying cycle should bring the internal metal temperature of the coldest item of the batch to 400°F and then hold at that temperature for 6 hours.

*** Section 8 - Exposure Controls / Personal Protection ***

Engineering Controls

If dust or fumes are generated through processing: Use with adequate explosion-proof ventilation to meet the limits listed in Section 8, Exposure Guidelines.

Personal Protective Equipment

Respiratory Protection

If dust or fumes are generated through processing: Use NIOSH-approved respiratory protection as specified by an Industrial Hygienist or other qualified professional if concentrations exceed the limits listed in Section 8, Exposure Guidelines. Suggested respiratory protection: P95, P100 for lead

Eye Protection

Wear safety glasses/goggles to avoid eye contact.

Skin Protection

Wear impervious gloves to avoid repeated or prolonged skin contact with residual oils and to avoid any skin injury.

General

Personnel who handle and work with **molten metal** should utilize primary protective clothing like polycarbonate face shields, fire resistant tapper's jackets, neck shades (snoods), leggings, spats and similar equipment to prevent burn injuries. In addition to primary protection, secondary or day-to-day work clothing that is fire resistant and sheds metal splash is recommended for use with molten metal. Synthetic materials should never be worn even as secondary clothing (undergarments).

Sampling to establish **lead** exposures is advised where exposures to airborne particulate or fumes are possible. Consult OSHA Lead Standard 29 CFR 1910.1025 for specific health/industrial hygiene precautions and requirements to follow when handling lead compounds.

Minimize breathing **oil vapors and mist**. Remove oil contaminated clothing; launder or dry-clean before reuse. Remove oil contaminated shoes and thoroughly clean and dry before reuse. Cleanse skin thoroughly after contact, before breaks and meals, and at the end of the work period. Oil coating is readily removed from skin with waterless hand cleaners followed by a thorough washing with soap and water.

Exposure Guidelines

A: General Product Information

Alcoa recommends an Occupational Exposure Limit for **Nickel Compounds** of 0.1 mg/m3 TWA.
Alcoa recommends an Occupational Exposure Limit for **Chromium (VI) Compounds [both soluble and insoluble forms]** of 0.25 ug/m3 TWA as chromium.
Alcoa recommends Occupational Exposure Limits for **Manganese** of 0.05 mg/m3 TWA (total particulate) and 0.02 mg/m3 TWA (respirable fraction).
Alcoa recommends an Occupational Exposure Limit for **Oil Mist** of 0.5 mg/m3 TWA.

B: Component Exposure Limits

Aluminum (7429-90-5)
ACGIH 10 mg/m3 TWA (metal dust)
OSHA 15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)

Silicon (7440-21-3)
OSHA 15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)

Manganese (7439-96-5)
ACGIH 0.2 mg/m3 TWA
OSHA 5 mg/m3 Ceiling (fume)

Copper (7440-50-8)
ACGIH 0.2 mg/m3 TWA (fume); 1 mg/m3 TWA (dust and mist, as Cu)
OSHA 0.1 mg/m3 TWA (fume); 1 mg/m3 TWA (dust and mist)

Tin* (7440-31-5)
ACGIH 2 mg/m3 TWA
OSHA 2 mg/m3 TWA (as Sn, except oxides)

Chromium (7440-47-3)
ACGIH 0.5 mg/m3 TWA
OSHA 1 mg/m3 TWA

Nickel (7440-02-0)
ACGIH 1.5 mg/m3 TWA (inhalable fraction)
OSHA 1 mg/m3 TWA

Lead (7439-92-1)**
ACGIH 0.05 mg/m3 TWA
OSHA 50 µg/m3 TWA
OSHA 50 µg/m3 TWA (as Pb); 30 µg/m3 Action Level (as Pb. Poison - see 29 CFR 1910.1025)

C: Exposure Limits for Additional Compounds Which May Be Formed During Processing

Alumina (non-fibrous) (1344-28-1)
ACGIH 10 mg/m3 TWA (particulate matter containing no asbestos and <1% crystalline silica)
OSHA 15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)

Zinc oxide (1314-13-2)
ACGIH 2 mg/m3 TWA (respirable fraction)
ACGIH 10 mg/m3 STEL (respirable fraction)
OSHA 5 mg/m3 TWA (fume); 15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)

Magnesium oxide fume (1309-48-4)
ACGIH 10 mg/m3 TWA (inhalable fraction)
OSHA 15 mg/m3 TWA (total particulate)

Manganese inorganic compounds (Not Available)
ACGIH 0.2 mg/m3 TWA (as Mn) (related to Manganese compounds, inorganic)
OSHA 5 mg/m3 Ceiling (as Mn)

Iron oxide (1309-37-1)
ACGIH 5 mg/m3 TWA (respirable fraction)
OSHA 10 mg/m3 TWA

Tin oxide (1332-29-2)
ACGIH 2 mg/m3 TWA (as Sn)

Nickel insoluble compounds (Not Available)
ACGIH 0.2 mg/m3 TWA (inhalable fraction, as Ni) (related to Nickel insoluble inorganic compounds (NOS))
OSHA 1 mg/m3 TWA (as Ni)

Chromium (II) compounds (Not Available)
OSHA 0.5 mg/m3 TWA (as Cr)

Chromium (III) compounds (Not Available)
ACGIH 0.5 mg/m3 TWA (as Cr)
OSHA 0.5 mg/m3 TWA (as Cr)

Chromium (VI) compounds- water soluble (Not Available)
ACGIH 0.05 mg/m3 TWA (as Cr)

Chromium (VI) compounds (certain water insoluble forms) (Not Available)
ACGIH 0.01 mg/m3 TWA (as Cr)
OSHA 5 µg/m3 TWA
OSHA 2.5 µg/m3 Action Level (as Cr.); 5 µg/m3 TWA (as Cr. Cancer hazard - See 29 CFR 1910.1026)

Lead, inorganic compounds (Not Available)
ACGIH 0.05 mg/m3 TWA (as Pb)
OSHA 50 µg/m3 TWA (as Pb)
OSHA 50 µg/m3 TWA (as Pb); 30 µg/m3 Action Level (as Pb. Poison - see 29 CFR 1910.1025)

Oil mist, mineral (8012-95-1)
ACGIH 5 mg/m3 TWA (sampled by method that does not collect vapor)
ACGIH 10 mg/m3 STEL
OSHA 5 mg/m3 TWA

Ozone (10028-15-6)
ACGIH 0.05 ppm TWA (heavy work); 0.08 ppm TWA (moderate work); 0.10 ppm TWA (light work); 0.20 ppm TWA (heavy, moderate or light workloads, <=2 hours)
OSHA 0.1 ppm TWA; 0.2 mg/m3 TWA

Nitrogen dioxide (10102-44-0)
ACGIH 3 ppm TWA
ACGIH 5 ppm STEL
OSHA 5 ppm Ceiling; 9 mg/m3 Ceiling

Nitric oxide (10102-43-9)
ACGIH 25 ppm TWA
OSHA 25 ppm TWA; 30 mg/m3 TWA

*** Section 9 - Physical & Chemical Properties ***

Physical State:	Solid: sheet, plate, wire, rod, bar, extrusion, forgings, etc.	**Appearance:**	Silvery
Boiling Point:	Not applicable	**Melting Point:**	Range: generally 1030-1210°F (554-654°C)
Vapor Pressure:	Not applicable	**Vapor Density:**	Not applicable
Solubility in Water:	None	**Specific Gravity:**	See Density
Density:	Range: generally 2.69-2.72 g/cm3 (0.097-0.099 lb/in3)	**pH Level:**	Not applicable
Odor:	None	**Odor Threshold:**	Not applicable
Octanol-Water Coefficient:	Not applicable		

*** Section 10 - Chemical Stability & Reactivity Information ***

Stability
Stable under normal conditions of use, storage, and transportation as shipped.

Conditions to Avoid

Chips, fines, dust and molten metal are considerably more reactive with the following:
* **Water:** Slowly generates flammable/explosive hydrogen gas and heat. Generation rate is greatly increased with smaller particles (e.g., fines and dusts). Molten metal can react violently/explosively with water or moisture, particularly when the water is entrapped.
* **Heat:** Oxidizes at a rate dependent upon temperature and particle size.
* **Strong oxidizers:** Violent reaction with considerable heat generation. Can react explosively with nitrates (e.g., ammonium nitrate and fertilizers containing nitrate) particularly when heated or molten.
* **Acids and alkalis:** Reacts to generate flammable/explosive hydrogen gas. Generation rate is greatly increased with smaller particles (e.g., fines and dusts).
* **Halogenated compounds:** Many halogenated hydrocarbons, including halogenated fire extinguishing agents, can react violently with finely divided aluminum.
* **Iron oxide (rust) and other metal oxides (e.g., copper and lead oxides):** A violent thermite reaction generating considerable heat can occur. Reaction with aluminum fines and dusts requires only very weak ignition sources for initiation. Molten aluminum can react violently with iron oxide without external ignition source.
* **Iron powder and water:** An explosive reaction forming hydrogen gas occurs when heated above 1470°F (800°C).

Thermite explosions have been reported when aluminum alloys were melted in furnaces used for alloying with lead, bismuth or other metals with low melting temperatures. These metals, when added as high purity ingots, can seep through cracks in furnace liners and become oxidized. During subsequent melts in the furnace, molten aluminum can contact these metal oxides resulting in a thermite explosion.

*** Section 11 - Toxicological Information ***

Health Effects Associated with Individual Ingredients

Lead dust or fume Can cause irritation of eyes and upper respiratory tract. Acute overexposures: Can cause nausea and muscle cramps. Chronic overexposures: Can cause weakness in the extremities (peripheral neuropathy), abdominal cramps and other gastrointestinal tract effects, kidney damage, liver damage, central nervous system damage, damage to blood forming organs, blood cell damage and reproductive harm. Can cause reduced fertility and fetal toxicity in pregnant women. IARC/NTP: Listed as "reasonably anticipated to be a human carcinogen" by the NTP. Listed as possibly carcinogenic to humans by IARC (Group 2B)*.

Nickel dust and fumes Can cause irritation of eyes, skin and respiratory tract. Eye contact: Can cause inflammation of the eyes and eyelids (conjunctivitis). Skin contact: Can cause sensitization and allergic contact dermatitis. Chronic overexposures: Can cause perforation of the nasal septum, inflammation of the nasal passages (sinusitis), respiratory sensitization, asthma and scarring of the lungs (pulmonary fibrosis). **Nickel alloys** IARC/NTP: Reviewed but not recommended for listing by the NTP. Listed as possibly carcinogenic to humans by IARC (Group 2B)*.

Chromium dust and mist Can cause irritation of eyes, skin and respiratory tract. **Chromium and trivalent chromium** IARC/NTP: Not classified by IARC.

Copper dust and mists Can cause irritation of eyes, mucous membranes, skin and respiratory tract. Chronic overexposures: Can cause reduction in the number of red blood cells (anemia), skin abnormalities (pigmentation changes) and hair discoloration.

Manganese dust or fumes Chronic overexposures: Can cause inflammation of the lung tissue, scarring of the lungs (pulmonary fibrosis), central nervous system damage, secondary Parkinson's disease and reproductive harm in males.

Silicon, inert dusts Chronic overexposures: Can cause chronic bronchitis and narrowing of the airways.

Tin (dust and fume) Chronic overexposures: Can cause benign lung disease (stannosis).

Aluminum dust, fines and fumes Low health risk by inhalation. Generally considered to be biologically inert (milling, cutting, grinding).

Some products are supplied with a lubricant/oil coating or have residual oil from the manufacturing process. **Oil** Can cause irritation of skin. Skin contact (prolonged or repeated): Can cause dermatitis.

Health Effects Associated with Individual Compounds Formed During Processing
(The following could be expected if welded, remelted or otherwise processed at elevated temperatures.)
Hexavalent chromium (Chrome VI) Can cause irritation of eyes, skin and respiratory tract. Skin contact: Can cause irritant dermatitis, allergic reactions and skin ulcers. Chronic overexposures: Can cause perforation of the nasal septum, respiratory sensitization, asthma, the accumulation of fluid in the lungs (pulmonary edema), lung damage, kidney damage, lung cancer, nasal cancer and cancer of the gastrointestinal tract. IARC/NTP: Listed as "known to be a human carcinogen" by the NTP. Listed as carcinogenic to humans by IARC (Group 1)*.

Nickel compounds Associated with lung cancer, cancer of the vocal cords and nasal cancer. IARC/NTP: Listed as "known to be a human carcinogen" by the NTP. Listed as carcinogenic to humans by IARC (Group 1)*.

Magnesium oxide fumes Can cause irritation of eyes and respiratory tract. Acute overexposures: Can cause nausea, fever, chills, shortness of breath and malaise (metal fume fever).

Manganese oxide fumes Can cause irritation of eyes, skin and respiratory tract. Acute overexposures: Can cause nausea, fever, chills, shortness of breath and malaise (metal fume fever).

Copper fume Can cause irritation of eyes, mucous membranes and respiratory tract. Acute overexposures: Can cause nausea, fever, chills, shortness of breath and malaise (metal fume fever).

Zinc oxide fumes Can cause irritation of upper respiratory tract. Acute overexposures: Can cause nausea, fever, chills, shortness of breath and malaise (metal fume fever).

Iron oxide Chronic overexposures: Can cause benign lung disease (siderosis). Ingestion: Can cause irritation of gastrointestinal tract, bleeding, changes in the pH of the body fluids (metabolic acidosis) and liver damage.

Certain inorganic lead compounds: IARC/NTP: Listed as "reasonably anticipated to be a human carcinogen" by the NTP. Listed as probably carcinogenic to humans by IARC (Group 2A)*.

Silica, amorphous Acute overexposures: Can cause dryness of eyes, nose and upper respiratory tract.

Tin compounds (dust or fume) Can cause irritation of eyes, skin and respiratory tract.

Alumina (aluminum oxide) Low health risk by inhalation. Generally considered to be biologically inert.

If the product is heated well above ambient temperatures or machined, oil vapor or mist may be generated. **Oil vapor and mist** Can cause irritation of respiratory tract. Acute overexposures: Can cause bronchitis, headache, central nervous system effects (nausea, dizziness and loss of coordination) and drowsiness (narcosis).

Welding, plasma arc cutting, and arc spray metalizing can generate ozone. **Ozone** Can cause irritation of eyes, nose and upper respiratory tract. Acute overexposures: Can cause shortness of breath, tightness of chest, headache, cough, nausea and narrowing of airways. Effects are reversible on cessation of exposure. Acute overexposures (high concentrations): Can cause respiratory distress, respiratory tract damage, bleeding and the accumulation of fluid in the lungs (pulmonary edema). Effects can be delayed up to 1-2 hours. Additional information: Studies with experimental animals by inhalation have found genetic damage, reproductive harm, blood cell damage, lung damage and death.

Welding fumes IARC/NTP: Listed as possibly carcinogenic to humans by IARC (Group 2B)*.

Plasma arc cutting can generate oxides of nitrogen. **Oxides of nitrogen (NO and NO_2)** Can cause irritation of eyes, skin and respiratory tract. Acute overexposures: Can cause reduced ability of the blood to carry oxygen (methemaglobin). Can cause cough, shortness of breath, the accumulation of fluid in the lungs (pulmonary edema) and death. Effects may be delayed up to 2-3 weeks. **Nitrogen dioxide (NO_2)** Chronic overexposures: Can cause scarring of the lungs (pulmonary fibrosis).

Acute Toxicity of Ingredients/Formed Compounds

A: General Product Information

No information available for product.

B: Component Analysis - LD50/LC50

Magnesium (7439-95-4)
Oral LD50 Rat: 230 mg/kg
Silicon (7440-21-3)
Oral LD50 Rat: 3160 mg/kg
Manganese (7439-96-5)
Oral LD50 Rat: 9 g/kg
Iron (7439-89-6)
Oral LD50 Rat: 984 mg/kg
Nickel (7440-02-0)
Oral LD50 Rat: >8000 mg/kg

C: Formed Compound Toxicity - LD50s/LC50s

Alumina (non-fibrous) (1344-28-1)
Oral LD50 Rat: >5000 mg/kg
Zinc oxide (1314-13-2)
Oral LD50 Rat: >5000 mg/kg
Iron oxide (1309-37-1)
Oral LD50 Rat: >10000 mg/kg
Oil mist, mineral (8012-95-1)
Oral LD50 Mouse: 22 g/kg
Ozone (10028-15-6)
Inhalation LC50 Rat: 4800 ppb/4H
Nitrogen dioxide (10102-44-0)
Inhalation LC50 Rat: 88 ppm/4H
Nitric oxide (10102-43-9)
Inhalation LC50 Rat: 1068 mg/m3/4H

Carcinogenicity of Ingredients

A: Ingredient Carcinogenicity - IARC/NTP

Component	CAS	IARC 1	IARC 2A	IARC 2B	IARC 3	IARC 4	NTP K	NTP RA
Chromium	7440-47-3	No	No	No	Yes	No	No	No
Nickel	7440-02-0	No	No	Yes	No	No	No	No
Lead**	7439-92-1	No	No	Yes	No	No	No	Yes

B: Ingredient Carcinogenicity - ACGIH

Chromium (7440-47-3)
ACGIH A4 - Not Classifiable as a Human Carcinogen
Nickel (7440-02-0)
ACGIH A5 - Not Suspected as a Human Carcinogen
Lead (7439-92-1)**
ACGIH A3 - Confirmed animal carcinogen with unknown relevance to humans

Material Safety Data Sheet

Product Name: WROUGHT ALUMINUM PRODUCTS, 8xxx SERIES ALLOYS **ID: 668**

C: Ingredient References

Chromium (7440-47-3)
IARC Monograph 49 [1990] (listed under Chromium and Chromium compounds) Supplement 7 [1987]

Nickel (7440-02-0)
IARC Monograph 49 [1990], Supplement 7 [1987]

Lead* (7439-92-1)**
IARC Supplement 7 [1987], Monograph 23 [1980] (evaluated as a group)

Carcinogenicity of Compounds Formed During Processing

A: Formed Compound Carcinogenicity - IARC/NTP

Component	CAS	IARC 1	IARC 2A	IARC 2B	IARC 3	IARC 4	NTP K	NTP RA
Iron oxide	1309-37-1	No	No	No	Yes	No	No	No
Nickel compounds	Not Available	Yes	No	No	No	No	Yes	No
Chromium (III) compounds	Not Available	No	No	No	Yes	No	No	No
Chromium (VI) compounds (certain water insoluble forms)	Not Available	Yes	No	No	No	No	Yes	No
Lead, inorganic compounds (related to Lead compounds)	Not Available	No	Yes	No	No	No	No	Yes
Oil mist, mineral	8012-95-1	No	No	No	Yes	No	No	No
Welding fumes (NOC)	Not Available	No	No	Yes	No	No	No	No

B: Formed Compound Carcinogenicity - ACGIH

Alumina (non-fibrous) (1344-28-1)
ACGIH A4 - Not Classifiable as a Human Carcinogen

Magnesium oxide fume (1309-48-4)
ACGIH A4 - Not Classifiable as a Human Carcinogen

Iron oxide (1309-37-1)
ACGIH A4 - Not Classifiable as a Human Carcinogen (dust and fume)

Nickel insoluble compounds (Not Available)
ACGIH A1 - Confirmed Human Carcinogen (related to Nickel, Inorganic compounds, insoluble (NOS))

Chromium (III) compounds (Not Available)
ACGIH A4 - Not Classifiable as a Human Carcinogen

Chromium (VI) compounds- water soluble (Not Available)
ACGIH A1 - Confirmed Human Carcinogen

Chromium (VI) compounds (certain water insoluble forms) (Not Available)
ACGIH A1 - Confirmed Human Carcinogen

Lead, inorganic compounds (Not Available)
ACGIH A3 - Confirmed animal carcinogen with unknown relevance to humans

Ozone (10028-15-6)
ACGIH A4 - Not Classifiable as a Human Carcinogen (heavy, moderate, or light workloads)

Nitrogen dioxide (10102-44-0)
ACGIH A4 - Not Classifiable as a Human Carcinogen

C: Formed Compound References

Iron oxide (1309-37-1)
IARC Supplement 7 [1987], Monograph 1 [1972]

Nickel compounds (Not Available)
IARC Monograph 49 [1990] (evaluated as a group)

Chromium (III) compounds (Not Available)
IARC Monograph 49 [1990] (listed under Chromium and Chromium compounds) Supplement 7 [1987]

Chromium (VI) compounds (certain water insoluble forms) (Not Available)
IARC Monograph 49 [1990] (evaluated as a group)

Lead, inorganic compounds (Not Available)
IARC Monograph 87 in preparation
Oil mist, mineral (8012-95-1)
IARC Supplement 7 [1987], Monograph 33 [1984]
Welding fumes (NOC) (Not Available)
IARC Monograph 49 [1990]

Descriptions of IARC and NTP Classifications

IARC 1: The agent is carcinogenic to humans. There is sufficient evidence that a causal relationship existed between exposure to the agent and human cancer.
IARC 2A: The agent is probably carcinogenic to humans. Generally includes agents for which there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals.
IARC 2B: The agent is possibly carcinogenic to humans. Generally includes agents for which there is limited evidence in humans and less than sufficient evidence in experimental animals.
IARC 3: The agent is not classifiable as to its carcinogenicity to humans. Generally includes agents for which there is inadequate evidence in humans and inadequate or limited evidence in experimental animals.
IARC 4: The agent is probably not carcinogenic to humans. Generally includes agents for which there is evidence suggesting lack of carcinogenicity in humans and in experimental animals.
NTP K: Known to be a human carcinogen.
NTP RA: Reasonably anticipated to be a human carcinogen.

*** Section 12 - Ecological Information ***

Ecotoxicity

A: General Product Information

No information available for product.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Zinc (7440-66-6)
96 Hr LC50 Pimephales promelas: 6.4 mg/L
96 Hr EC50 Selenastrum capricornutum: 30 µg/L
72 Hr EC50 water flea: 5 µg/L
Copper (7440-50-8)
96 Hr LC50 Pimephales promelas: 23 µg/L; 96 Hr LC50 Oncorhynchus mykiss: 13.8 µg/L; 96 Hr LC50 Lepomis macrochirus: 236 µg/L
72 Hr EC50 Scenedesmus subspicatus: 120 µg/L
96 Hr EC50 water flea: 10 µg/L; 96 Hr EC50 water flea: 200 µg/L
Iron (7439-89-6)
96 Hr LC50 Morone saxatilis: 13.6 mg/L [static]
Nickel (7440-02-0)
96 Hr LC50 Oncorhynchus mykiss: 31.7 mg/L (adult); 96 Hr LC50 Pimephales promelas: 3.1 mg/L; 96 Hr LC50 Brachydanio rerio: >100 mg/L
72 Hr EC50 freshwater algae (4 species): 0.1 mg/L; 72 Hr EC50 Selenastrum capricornutum: 0.18 mg/L
96 Hr EC50 water flea: 510 µg/L
Lead (7439-92-1)**
96 Hr LC50 Pimephales promelas: 6.5 mg/L
48 Hr EC50 water flea: 600 µg/L

Environmental Fate

No information available for product.

*** Section 13 - Disposal Considerations ***

Disposal Instructions

Reuse or recycle material whenever possible. Material may be disposed of at an industrial landfill.

Schn - 00611

US EPA Waste Number & Descriptions

A: General Product Information

RCRA Status: Must be determined at time material is disposed. If material is disposed as waste, it must be characterized under RCRA according to 40 CFR, Part 261, or state equivalent in the U.S.

B: Component Waste Numbers

RCRA waste codes other than described under Section A may apply depending on use of product. Refer to 40 CFR 261 or state equivalent in the U.S.

*** Section 14 - Transportation Information ***

Special Transportation

	PSN #1	PSN #2	PSN #3	PSN #4
Notes:	(1)			
Proper Shipping Name:	Not regulated			
Hazard Class:	-			
UN NA Number:	-			
Packing Group:	-			
RQ:	-			
Other - Tech Name:	-			
Other - Marine Pollutant:	-			

Notes:

(1) When "Not regulated," enter the proper freight classification, "MSDS Number," and "Product Name" on the shipping paperwork.

Canadian TDG Hazard Class & PIN:	Not regulated

*** Section 15 - Regulatory Information ***

US Federal Regulations

A: General Product Information

All electrical equipment must be suitable for use in hazardous atmospheres involving aluminum powder in accordance with 29 CFR 1910.307. The National Electrical Code, NFPA 70, contains guidelines for determining the type and design of equipment and installation that will meet this requirement.
In reference to Title VI of the Clean Air Act of 1990, this material does not contain nor was it manufactured using ozone-depleting chemicals.

B: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Aluminum (7429-90-5)
SARA 313: 1.0 % de minimis concentration (dust or fume only)

Zinc (7440-66-6)
SARA 313: 1.0 % de minimis concentration (dust or fume only)
CERCLA: 1000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches); 454 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the solid metal released is equal to or exceeds 0.004 inches)

Manganese (7439-96-5)
SARA 313: 1.0 % de minimis concentration

Copper (7440-50-8)
SARA 313: 1.0 % de minimis concentration
CERCLA: 5000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches); 2270 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)

Chromium (7440-47-3)
CERCLA: 5000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches); 2270 kg final RQ (no reporting of releases of this hazardous material is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)

Nickel (7440-02-0)
SARA 313: 0.1 % de minimis concentration
CERCLA: 100 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches); 45.4 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)

Lead (7439-92-1)**
CERCLA: 10 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches); 4.54 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)

SARA 311/312 Physical and Health Hazard Categories:

Immediate (acute) Health Hazard:	Yes, if particulates/fumes generated during processing.
Delayed (chronic) Health Hazard:	Yes, if particulates/fumes generated during processing.
Fire Hazard:	No
Sudden Release of Pressure:	No
Reactive:	Yes, if molten

State Regulations

A: General Product Information

PENNSYLVANIA "Special Hazardous Substance": Chromium, Chromium compounds, hexavalent; Mineral oils, Nickel.

Chemical(s) known to the State of California to cause cancer: Chromium (hexavalent compounds), Lead and lead compounds, Nickel (metallic) and certain nickel compounds.

Chemical(s) known to the State of California to cause reproductive toxicity: Lead.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Aluminum	7429-90-5	Yes	No	Yes	Yes	Yes	Yes
Zinc	7440-66-6	Yes	No	Yes	No	Yes	Yes
Magnesium	7439-95-4	Yes	No	Yes	No	Yes	Yes
Silicon	7440-21-3	No	No	Yes	Yes	Yes	Yes
Manganese	7439-96-5	Yes	No	Yes	Yes	Yes	Yes
Copper	7440-50-8	Yes	No	Yes	Yes	Yes	Yes
Iron	7439-89-6	Yes	No	No	No	No	No
Tin*	7440-31-5	Yes	No	Yes	Yes	Yes	Yes
Chromium	7440-47-3	Yes	No	Yes	Yes	Yes	Yes
Nickel	7440-02-0	Yes	No	Yes	Yes	Yes	Yes
Lead**	7439-92-1	Yes	No	Yes	Yes	Yes	Yes

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):
WARNING! This product contains a chemical known to the state of California to cause cancer.
WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.

Other Regulations

A: General Product Information

Material meets the criteria for inclusion in WHMIS Class D2A

B: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Aluminum	7429-90-5	1 %
Manganese	7439-96-5	1 %
Copper	7440-50-8	1 %
Chromium	7440-47-3	0.1 %
Nickel	7440-02-0	0.1 %

C: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS	AUST.	MITI
Aluminum	7429-90-5	Yes	Yes	Yes	Yes	No
Zinc	7440-66-6	Yes	Yes	Yes	Yes	No
Magnesium	7439-95-4	Yes	Yes	Yes	Yes	No
Silicon	7440-21-3	Yes	Yes	Yes	Yes	No
Manganese	7439-96-5	Yes	Yes	Yes	Yes	No
Copper	7440-50-8	Yes	Yes	Yes	Yes	No
Iron	7439-89-6	Yes	Yes	Yes	Yes	No
Tin*	7440-31-5	Yes	Yes	Yes	Yes	No
Chromium	7440-47-3	Yes	Yes	Yes	Yes	No
Nickel	7440-02-0	Yes	Yes	Yes	Yes	No
Lead**	7439-92-1	Yes	Yes	Yes	Yes	Yes

Inventory Information

MITI Inventory: Pure metals are not specifically listed by CAS or MITI number on the MITI Inventory. However, the class of compounds for each of these metals is listed.

*** Section 16 - Other Information ***

MSDS History

Original: March 16, 1990
Supersedes: August 14, 2003
Revised: October 25, 2006

MSDS Status

10/25/2006: Reviewed on a periodic basis in accordance with Alcoa policy.
Changes in Sections 1, 2, 3, 4, 5, 7, 8, 10, 11, 12 & 15.
08/14/2003: Reviewed on a periodic basis in accordance with Alcoa policy. Changes in Sections 1, 2, 3, 8 and 15.

Prepared By

Hazardous Materials Control Committee
Preparer: Jon N. Peace, 412-553-2293/Stephanie Williams, 412-553-1479

MSDS System Number

115623

Other Information

* Aluminum Association's Bulletin F-1, "Guidelines for Handling Aluminum Fines Generated During Various Aluminum Fabricating Operations." The Aluminum Association, 900 19th Street, N.W., Washington, DC 20006.
* Aluminum Association, "Guidelines for Handling Molten Aluminum, The Aluminum Association, 900 19th Street, N.W., Washington, DC 20006.
* NFPA 65, Standard for Processing and Finishing of Aluminum (NFPA phone: 800-344-3555)
* NFPA 651, Standard for Manufacture of Aluminum and Magnesium Powder
* NFPA 70, Standard for National Electrical Code (Electrical Equipment, Grounding and Bonding)
* NFPA 77, Standard for Static Electricity
* Guide to Occupational Exposure Values-2006, Compiled by the American Conference of Governmental Industrial Hygienists (ACGIH).
* Documentation of the Threshold Limit Values and Biological Exposure Indices, Sixth Edition, 1991, Compiled by the American Conference of Governmental Industrial Hygienists, Inc. (ACGIH).
* NIOSH Pocket Guide to Chemical Hazards, U.S. Department of Health and Human Services, February 2004.

* Patty's Industrial Hygiene and Toxicology: Volume II: Toxicology, 4th ed., 1994, Patty, F. A.; edited by Clayton, G. D. and Clayton, F. E.: New York: John Wiley & Sons, Inc.
* expub, www.expub.com, Expert Publishing, LLC.

Key-Legend:

ACGIH	American Conference of Governmental Industrial Hygienists
AICS	Australian Inventory of Chemical Substances
CAS	Chemical Abstract Service
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CPR	Cardio-pulmonary Resuscitation
DOT	Department of Transportation
DSL	Domestic Substances List (Canada)
EC	Effective Concentration
ED	Effective Dose
EINECS	European Inventory of Existing Commercial Chemical Substances
EPA	Environmental Protection Act
IARC	International Agency for Research on Cancer
LC_{50}	Lethal concentration (50 percent kill)
LC_{Lo}	Lowest published lethal concentration
LD_{50}	Lethal dose (50 percent kill)
LD_{Lo}	Lowest published lethal dose
LFL	Lower Flammable Limit
MITI	Ministry of International Trade & Industry
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
NORM	Naturally occurring radioactive materials
NTP	National Toxicology Program
OEL	Occupational Exposure Limit
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PIN	Product Identification Number
PSN	Proper Shipping Name
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act
STEL	Short Term Exposure Limit
TCLP	Toxic Chemicals Leachate Program
TDG	Transportation of Dangerous Goods
TLV	Threshold Limit Value
TSCA	Toxic Substance Control Act
TWA	Time Weighted Average
UFL	Upper Flammable Limit
WHMIS	Workplace Hazardous Materials Information System
atm	atmosphere
cm	centimeter
g, gm	gram
in	inch
kg	kilogram
lb	pound
m	meter
mg	milligram
ml, ML	milliliter
mm	millimeter
mppcf	million particles per cubic foot
n.o.s.	not otherwise specified
ppb	parts per billion
ppm	parts per million
psia	pounds per square inch absolute
u	micron
ug	microgram

INFORMATION HEREIN IS GIVEN IN GOOD FAITH AS AUTHORITATIVE AND VALID; HOWEVER, NO WARRANTY, EXPRESS OR IMPLIED, CAN BE MADE.

This is the end of MSDS # 668

WROUGHT ALUMINUM PRODUCTS

6xxx SERIES ALLOYS

⚠ WARNING

Physical Hazards: Non-combustible as supplied. Small chips, fine turnings and dust may ignite readily. Explosion potential may be present when: (1) dusts or fines are dispersed in the air, (2) fines, dust or molten aluminum are in contact with certain metal oxides (e.g. rust) or (3) chips, fines, dust or molten aluminum are in contact with water or moisture.

Health Hazards: Health effects generally expected in cases of overexposures:

EYES: Dust or fume from processing: Can cause irritation.

SKIN: Contact with residual oil/oil coating: Can cause irritation. Prolonged or repeated contact with the skin can cause dermatitis. Dust or fume from processing: Can cause sensitization and allergic contact dermatitis.

INHALATION: Health effects from mechanical processing (e.g., cutting, grinding): Can cause irritation of respiratory tract. **Chronic overexposures:** Can cause reduction in the number of red blood cells (anemia), skin abnormalities (pigmentation changes), scarring of the lungs (pulmonary fibrosis) benign lung disease (stannosis), central nervous system damage, secondary Parkinson's disease and reproductive harm. Additional health effects from elevated temperature processing (e.g., welding, melting): **Acute overexposures:** Can cause nausea, fever, chills, shortness of breath and malaise (metal fume fever) and reduced ability of the blood to carry oxygen. **Chronic overexposures:** Can cause respiratory sensitization and lung cancer.

WARNING: Chromium (hexavalent compounds), Lead and lead compounds and Nickel (metallic) and nickel compounds are chemicals known to the State of California to cause cancer. Lead is a chemical known to the State of California to cause developmental toxicity. (Proposition 65)

Precautions: Avoid generating dust. Use with adequate ventilation. Keep material dry. Use appropriate personal protective equipment (safety glasses/gloves) to avoid injury. Use appropriate NIOSH approved respiratory protection (P95; P100 for lead) if concentrations exceed the permissible limits.

Fire Fighting: Use Class D extinguishing agents on dusts, fines or molten metal. Use coarse water spray on chips and turnings. DO NOT USE: Halogenated agents on small chips, dusts or fines, water around molten metal. These agents will react with the burning material.

First Aid (dust or fume from processing): EYES: Flush eyes with plenty of water or saline for at least 15 minutes. Consult a physician. SKIN: Wash skin with soap and water for at least 15 minutes. Consult a physician if irritation persists. INHALATION: Remove to fresh air. If unconscious or severely injured, check for clear airway, breathing and presence of pulse. Perform CPR if there is no pulse or respiration. Consult a physician.

See Alcoa Material Safety Data Sheet No. 668 for more information about use and disposal.

Emergency Phone: (412) 553-4001.

INGREDIENTS:	CAS NUMBERS:	INGREDIENTS:	CAS NUMBERS:
Aluminum	(7429-90-5)	Iron	(7439-89-6)
Zinc	(7440-66-6)	Tin*	(7440-31-5)
Magnesium	(7439-95-4)	Chromium	(7440-47-3)
Silicon	(7440-21-3)	Nickel	(7440-02-0)
Manganese	(7439-96-5)	Lead**	(7439-92-1)
Copper	(7440-50-8)		

* Alloy C711 Only; **Alloys C04A, C66A, C12B, C13B, C34B, C38B and C44B

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ALCOA

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